

MEMBERS
LOIS WOLK
CHAIR
NOREEN EVANS
DOUG LA MALFA

California Legislature

LEGISLATIVE OFFICE BUILDING
1020 N STREET, SUITE 556B
SACRAMENTO, CA 95814
TEL (916) 651-1896
FAX (916) 323-2603

SUSAN BOYD
PRINCIPAL CONSULTANT
SUSAN.BOYD@SEN.CA.GOV

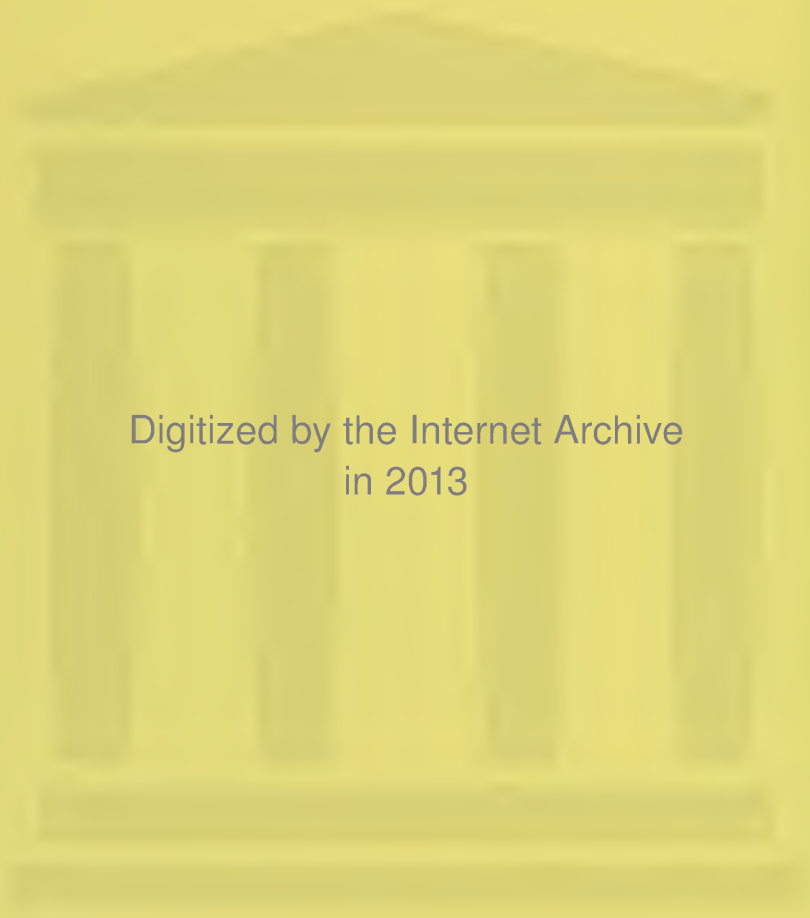
SENATE SUBCOMMITTEE ON OLIVE OIL PRODUCTION AND EMERGING PRODUCTS

LOIS WOLK
CHAIR

Challenges Facing California's Olive Oil Industry



Thursday, January 26, 2012
California State Capitol
Sacramento, California



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<http://archive.org/details/challengesfacing2012cali>

TABLE OF CONTENTS

AGENDA

BIOGRAPHY OF SPEAKERS

TRANSCRIPT OF HEARING

U.C. DAVIS OLIVE OIL STUDIES

JULY 2010

APRIL 2011

LEGISLATION

SB 818-CHAPTER 567, STATUTES OF 2011

SENATE FLOOR ANALYSIS

HEARING BACKGROUND INFORMATION

SENATE OLIVE OIL ADVISORY COMMITTEE

California Legislature

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SACRAMENTO, CA 95814
TEL (916) 651-1896
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LOIS WOLK
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Challenges Facing California's Olive Oil Industry

Thursday, January 26, 2012

1:30PM

California State Capitol, Room 3191

INTRODUCTORY REMARKS:

Senator Lois Wolk

PANEL I- Extra Virgin Olive Oil Fraud

Dan Flynn

Executive Director, UC Davis Olive Center

Tom Mueller

Author, Journalist--Genoa, Italy

Extra Virginity: The Sublime and Scandalous World of Olive Oil

PANEL II-California Olive Oil Industry Perspective

Adam Englehardt

Vice President of Orchard Operations for California Olive Ranch, Oroville

Brady Whitlow

President, Corto-Olive, Stockton

Brendon Flynn

President, California Olive Oil Council

Jim Etters

Director of Land Management, Yocha Dehe Wintun Nation, Capay Valley

Mike Bradley

President, Veronica Foods Company, Oakland

PANEL III-World View

Bob Bauer

President, North American Olive Oil Association, Neptune, New Jersey
Representing Olive Oil importers and Suppliers

Paul Miller

President, Australian Olive Association, Ltd., Melbourne, Australia

BIOGRAPHY
OF
SPEAKERS



Biographies of Presenters

Dan Flynn, Executive Director, UC Davis Olive Center

Dan Flynn is executive director of the UC Davis Olive Center, a self-funded university/industry partnership with the goal to do for olives and olive oil what UC Davis did for California wine. The center was established in 2008 and is the only one of its kind in North America. The center's core assets are the 30 expert faculty members, extension specialists, and farm advisors who provide an interdisciplinary resource for olive growers and processors. Over the past four years the center has delivered or secured funding for 49 research projects and campus resources valued in excess of \$1.7 million, tripled educational events for olive growers and processors, established an olive oil sensory panel, established a chemistry research laboratory, planted campus olive orchards, and consulted on three successful industry-sponsored legislative measures. The center's work has been reported internationally in more than 1,000 media outlets. The center funds its operations through its research and education activities as well as from sales of olive products at the campus book store.

Tom Mueller, Journalist, Author

Tom Mueller is an American writer and freelance journalist he has contributed to the New Yorker, National Geographic, the New York Times, Atlantic Monthly, and other publications, on topics that frequently combine science and the humanities. In 2007, for the New Yorker, he wrote "Slippery Business: The trade in adulterated olive oil," which drew attention to the distortions inherent in the olive oil business, as well as to the admirable qualities of fine oil. His recently-published book, *Extra Virginity*, based on travel and reporting on 4 continents, profiles the saints and sinners of olive oil, and explores oil culture through the centuries, in California, the Mediterranean, Australia, and beyond. He has lived in various parts of Europe since 1986, and since 1994 has been based in Liguria, Italy. He holds a BA from Harvard, and a doctorate from Oxford, where he was a Rhodes Scholar.

Adam Englehardt, Vice President of Orchard Operations, California Olive Ranch

Adam Englehardt, Vice President of Orchard Operations for California Olive Ranch manages operations of 5000 acres of company orchards planted in Arbequina, Arbosana, and Koroneiki. In addition to COR orchards Adam oversees grower relations and purchasing of fruit from an additional 10,000 of super high density orchards in California which deliver fruit to California Olive Ranch processing plants. Adam is a 5th generation California farmer and graduate of Cal Poly San Luis Obispo. His family originally farmed traditional mission olives for oil and planted Arbequina and Tuscan varieties in 2001 and 2001 prior to construction of a small olive oil mill in the Livermore valley in 2005.

Brady Whitlow, President, Corto-Olive

Brady Whitlow is the President of Corto Olive, one of California's largest olive oil companies located in Lodi, California. This five year old company grows, mills and markets extra virgin olive oil from super high density plantings. With an annual capacity approaching five hundred thousand gallons of extra virgin olive oil, Corto Olive is positioned to have a significant impact on California's emerging olive oil industry.

Brady has spent most of his career in the sales and marketing of specialty food products. He has worked for several consumer products companies including: Basic American Foods, Barbara's Bakery, Amy's Kitchen and Muir Glen Tomato Products.

Brady has a B.A. from the University of Oregon and an M.B.A. from Santa Clara University.

Brendon Flynn, General Manager, Pacific Farms and Orchards, Inc.
President, California Olive Oil Council

Brendon Flynn is a third generation farmer who was born and raised in Tehama County in Northern California. Pacific Farms was originally started by his grandfather in 1952. Brendon holds a B.S. in Agricultural Business from Cal Poly, San Luis Obispo. After working in many different areas and disciplines related to agri-business, Brendon decided to return to his family's farming operation to pursue a career in production agriculture.

Jim Etters, Director of Land Management, Yocha Dehe Wintun Nation

A native of Yolo County, Jim Etters has been involved in farming, ranching and outdoor activities his entire life. Jim's love of nature and agriculture led him to a career focused on land stewardship. For last 8 years, he has brought that commitment to the development of the Department of Land Management for the Yocha Dehe Wintun Nation in California's Capay Valley.

As the Director of Land Management, Jim oversees more than 11,000 acres of tribal land including a diversified farming and ranching operation, habitat restoration and grant work, a tribally owned winery, and a 250 acre organic farm.

Jim has spearheaded the Tribe's vision of starting its own line of premium agricultural products under the Séka Hills brand. The very first product released -- the 2010 Viognier wine -- scored 93 points and won Best of Class at the 2011 California State Fair.

In 2008, Jim advised the Tribe on planting the first large scale development of super high density olives in the Capay Valley. In the summer of 2011, the Tribe began construction of the Séka Hills Olive Mill- a state-of-the-art mill that will produce premium olive oil from the Tribe's harvest and also offer premium local milling for other Capay Valley olive growers. The mill will be ready for production for the 2012 fall harvest.

Jim and his wife Kindra are residents of Capay Valley.

Mike Bradley, President, Veronica Foods Company

Mike Bradley is the President of Veronica Foods Company, established in 1924. He is a world renowned olive oil expert, enthusiast, organic producer, and importer. As a vocal advocate for stricter quality standards, he is intent on changing the way the end-user consumes and understands extra virgin olive oil. He is convinced that both olive oil producers and consumers will dramatically alter their practices when the facts concerning nutrition, quality, and durability are clearly understood. As part of his company's quality initiative, fruit is often purchased on the tree and crushed to an exacting standard to meet the company's unparalleled chemical and sensory specifications. Michal's often quoted as saying, "Freshness is paramount and trump most other criteria such as where the oil was produced."

Bob Bauer, President, North American Olive Oil Association

Bob Bauer is the president of the North American Olive Oil Association, headquartered in Neptune, N.J. The NAOOA is committed to supplying North American consumers with quality products in a fair and competitive environment; to fostering a clear understanding of the different grades of olive oil; and to making consumers aware of the taste, versatility and health benefits of olive oil. The NAOOA's membership is comprised of U.S. and Canadian companies marketing olive oil in North America and foreign companies supplying olive oil to the North American market. The NAOOA is part of the Association of Food Industries, an association of nearly 1,000 companies worldwide that fosters international trade of food products.

Mr. Bauer has served as president of the NAOOA since January 2002. Prior to that, he served as vice president of the organization for nearly six years. Mr. Bauer also serves as president of AFL. In 2005 he was appointed to the Agricultural Technical Advisory Committee for trade in Processed Foods. He was reappointed to that committee in 2008 and again in 2011.

Before joining the NAOOA, Mr. Bauer was a journalist. While working in the newspaper field, he covered everything from town meetings to health-related issues to a wide range of sports, ranging from high school to professional levels. From newspapers, he moved to trade publications in the transportation field and then to the food industry. For the two years prior to joining the NAOOA, he worked as the editor of the grocery section of Supermarket News, the leading trade publication in the supermarket field.

Mr. Bauer attended Temple University for two years and then completed his college education and received his bachelor's degree from Glassboro State College, now known as Rowan University. He and his wife, Robin, have four children.

Paul Miller, President, Australian Olive Association, Ltd.

Paul Miller is an agricultural scientist with a lifetime in farming whose research background encompasses intensive tree crops, plant chemistry and climate responses of fruit trees. Paul has been President of the Australian Olive Association Ltd (AOA) the olive industry body in Australia since 2001. He leads the AOA on trade and quality standards for olive oil, developing better methods of authenticating olive oil and helping to change the global scene for olive oil. Paul chairs the committee that developed and oversees the new Australian Standard for Olive Oils and Olive Pomace Oils AS 5264-2011 as well as leading the Australian Olive Industry Code of Practice with its Certified Australian Extra Virgin branding. Paul is a founding member of the AOCS Olive Oil Expert Committee and of the EuroFed Lipids Division of Olive Oil based in Frankfurt. Paul's is a director of several businesses in the wine industry, grows wine-grapes and chestnuts and advises olive companies in Australia and the USA. He has also recently established a specialist food-oil-technology company Oilmiller Pty Ltd.

TRANSCRIPT
OF
HEARING

**Senate Subcommittee on Olive Oil Production
And Emerging Products**

**Informational Hearing on:
Challenges Facing California's Olive Oil Industry**

**January 26, 2011
State Capitol, California**

Lois Wolk, Chair

SENATOR LOIS WOLK: Good afternoon. I'm Senator Lois Wolk, chair of the Senate's Agricultural Subcommittee on Olive Oil Production and Emerging Products. I want to introduce my colleague, Senator Tom Berryhill, and we expect others, we hope shortly, from the subcommittee as well as from ... everyone has been invited from both the Assembly and the Senate.

A few housekeeping details: There are lots of handouts and the agenda and a few other things you might be interested in up at the front, right here. The hearing today is being televised on the Senate Capitol channel. It's available live on the CalChannel webcast. So there will be a record of this, and there will be DVDs and transcribed copies of the hearing that will be available to anyone here or who's listening to this elsewhere.

Our committee consultant is Susan Boyd, so if you want to request a copy, those of you that are here or those of you that hear my voice, please contact her through the committee.

And I'm very pleased that we have a full house, frankly, here today. That's great. So many of you have taken the time to be here. I want to, first of all, thank all the presenters ahead of time. Many have traveled from not only elsewhere in the state, even across the causeway, but from plenty of places throughout the state, throughout the country, and frankly, even the world. So let's begin.

I'd like to make a few introductory remarks, and then we have three panels. There will be ample time for questions and comments from our members. I hope to have a really good discussion about the challenges that are facing the new and burgeoning olive oil industry.

Let me just begin by saying that California has a long history of support for new agricultural industries as they develop. CDFA (California Department of Food and Ag)

was formed a hundred years ago, and one of its main charges was to adapt public policy to changing industries—to the changing agricultural industry. And it's had a history of that. It's been very much involved with marketing and education and standards and a number of things that have led to what is a tremendously, frankly, successful agricultural industry. So olive oil, which has been growing rapidly over the past few years, is moving right into that area.

Since last year, the acreage that has been planted in olive trees has doubled from just three years ago. There are 400, we think—and probably more—growers and producers at this time; and there are over 50 varieties of trees—of olive oil.

The olive oil industry is expanding, and not surprisingly so. It's a result of what we have here in California. It's an ideal climate and rich soil, and we have super-high density techniques for planting and harvesting. The olive oil tree requires very little water, which, as we all know—and I wear a different hat on that—is at a premium in our state. So it just fits right in. It's a great industry. It provides a very heart-healthy product. We also have the development at UC Davis of an Olive Center, and we'll hear from its director shortly.

My colleagues and I look forward to working with the industry, with the growers, the producers, and the consumers to hear the challenges that you face and to help put together solutions that will ensure a sustainable industry, a healthy industry that can compete not only throughout the country but throughout the world.

So I'd like to invite my colleague—Senator Tom Berryhill—to make any comments you'd like.

SENATOR TOM BERRYHILL: Sure. And thank you, Madam Chairman, for inviting me in the first place, to be a part of this committee.

The olive oil industry is emerging as a dynamic industry, and it, quite frankly, doesn't surprise me that we have a full house here today. This is an industry that reminds me—I'm a grape grower—and this reminds me very much of maybe the early stages of the grape growing phenomenon when everything was happening very quickly. There were quality issues; there were many different individuals in different regions, in different appellations that had concerns about their quality and better quality in one area as another.

I think we have a fantastic opportunity here today to start a conversation on how to best manage this industry as we move forward. I'm looking forward to hearing

from a number of folks that are experts and growers in this industry, Lois. And hopefully, we're going to have a series of hearings that we can come up with something that makes some sense for everybody, that makes everybody somewhat happy. I mean, most times when we come up to a final consensus, it may not be perfect, but what we're doing here today is starting the process of trying to come up with something that makes some sense for everybody.

So welcome everybody that's here. We're glad you're here, and we're looking very forward to listening to the folks today.

SENATOR WOLK: Thanks, Tom.

Can I have the first panel come forward? And as you do, I will introduce you briefly; although, you probably need no introduction in this room.

I'd like to welcome Senator La Malfa, who is a member of the subcommittee. Welcome.

Welcome, Dan. Welcome, Tom.

First of all, Dan Flynn, our first speaker, is executive director of the UC Davis Olive Center, which was established in 2008 and is the only one of its kind in North America. The center's core assets are the 30 expert faculty members, the extension specialists, and the farm advisors who provide an interdisciplinary resource for olive growers and processors. Dan Flynn has been an excellent advisor to this subcommittee and to me and to the chair of the Agriculture Committee, Senator Cannella, on the two pieces of legislation that we were able to pass; one that had to do with standards and the second as to the root stock quality.

So Dan—welcome.

MR. DAN FLYNN: Thank you, Madam Chair and members of the subcommittee. The sergeant has passed out a couple of reports that UC Davis has completed over the last couple of years, so I will refer to those in my very brief remarks here.

First, I just want to let you know what the Olive Center does at UC Davis. We've been around for about four years, and our goal is to do for olive oil and table olives what UC Davis did for wine. And we do that through our own self-funded efforts. We actually don't receive public funding for any of our operational costs. Entrepreneurial efforts include selling olive oil at the bookstore, putting on seminars, bringing in research; those kinds of things.

Even though as a land-grant university UC Davis is primarily concerned about California agriculture, we're also a global institution. And the spread of UC Davis influence goes across the globe and there's plenty of graduates from UC Davis in various places around the world.

The topic of the hearing today on challenges facing the California olive oil industry are ... they're issues that actually also have a global reach, and I'd like to identify two of the main issues before passing it on to Tom Mueller. The two primary issues that I believe we can talk about today deal with quality—number one—and authenticity—number two.

There's all different kinds of olive oil grades out there. Rather than trying to explain all those, it really could be very simply laid out. When it comes to quality, the first issue, if you think of a line between extra virgin—which we all know is the top quality oil—and everything else below the line, what the line represents is defects—flavor defects. That's one of the main criteria in the international standard. And the flavor defects can be things like rancidity. There's descriptors such as “musty” or “fusty” or “winey,” and these are all essentially bad flavors that can occur in olive oil for various reasons. Extra virgin is supposed to not have any of those bad flavors, so from a quality standpoint—extra virgin, zero defects.

What we've done at UC Davis are a couple of studies on looking at this issue of quality. What we found in the course of going to supermarkets around the state, over the course of more than a year, was that this very simple measure of quality is not adhered to in most cases with imported olive oil that's labeled as “extra virgin.”

So I will just discuss—and these reports have been passed out. I'll just refer to this green report, the one with the green cover, which we released in April, which took 134 samples of olive oil from off the shelf in California, in the Sacramento, in the Bay Area, and the L.A. markets, and we took the top five imported branded oils. We also took the top-selling California branded oil, the top-selling Australian branded oil, and the top-selling what I would call a premium Italian oil, that was priced at a premium level and is solely from Italy.

We subjected those oils to a number of chemical tests as well as this basic sensory test that I describe of the line between extra virgin and everything else being nondefective. What we found was that 73 percent of the imported branded oils did not meet this very minimal standard of quality; meaning that 73 percent of the top five

branded olive oils sold in California that we selected at random from supermarket shelves, did not meet what was described on the label as “extra virgin.” As I mentioned, the defects can include rancidity, musty, fusty, etc.

We found that the California oils did much better; the Australian oils did much better. Not that these oils were perfect in every respect. I think it’s a marker of the fragility and perishability of olive oil that even with those oils, when you have an oil that comes from California, you can have situations where the oil goes below a standard. And it’s something that I think the quality producers everywhere are interested in trying to make sure that the best possible quality ultimately is delivered to the consumer.

So the reaction we got to that study was one of questioning UC Davis’s credentials, and this is an oil ... or a study that was conducted with funding from the California olive oil industry. So that was a criticism is that, you know, we were just sort of supporting the home team here. But what we found actually isn’t any different from what *Consumer Reports* found in 2004, when they found a number of the top-labeled olive oils sold in the United States were defective. It’s no different from what they found in Germany and Canada, in Australia, in Uruguay, and even by the Department of Health in Andalusia in Spain and this is the largest area of olive oil production in the world. Where in Spain—just to put it in perspective—there are 6 million acres of olives in Spain. And even in the top area for production in the world, the Department of Health found quality problems with olive oil sold in the stores.

So that’s the first issue: quality.

And then the second issue is different, and that deals with authenticity. So we’re not talking about whether olive oil meets a grade standard; we’re talking about whether something sold as olive oil is actually made from olives. And this is something that Tom’s book addressed and his earlier article in *The New Yorker* addressed. And it’s not an issue that we’ve studied as of yet, but drawing from the work that Tom has done and the interviews that he has done, he has found that ... you know, when the federal government used to pull olive oil off the shelf to test for its authenticity, from the 1930s through the 1990s, every single decade they found that there was adulterated oil that was labeled as “olive oil.” It could have been from

cheaper seed oil: soy, cottonseed, whatever. The FDA found that even in the 1980s, up to 50 percent of the oils that they tested was adulterated.

There's been no recent studies. The FDA has sort of put this on a lower priority in the era of bioterrorism, E. coli, and salmonella. But the insiders that I've talked to, who know this area well, and I think even—you'll hear later from the North American Olive Oil Association, which has done their own testing—that they found that there is quite a bit of adulteration still occurring in olive oil, particularly in the food service arena where price is of paramount concern to high-volume food service providers, that as that price goes below a certain threshold, the authenticity of that oil becomes more questionable.

So in closing, let me just say that the Legislature, with the bill that you authored last session, Madam Chair, has identified these lines very clearly on quality and authenticity. On quality, it's whether extra virgin olive oil is defective or not. It shouldn't be. That's the line separating extra virgin from everything else. On authenticity, the line is whether that olive oil is actually made from olives, and that's in California law right now. So the question really isn't, where is the line drawn? The question is, who's enforcing the line and who's holding the line?

SENATOR WOLK: All right. Thank you, Mr. Flynn. What I think I'll do is we'll hear from the entire panel and then delve into questions. Is that okay?

MR. FLYNN: Sure.

SENATOR WOLK: All right. Thank you.

Tom Mueller—welcome. Welcome. We're very glad to see you. He is an American writer and freelance journalist, and he's contributed to *The New Yorker*, *National Geographic*, *The New York Times*, *The Atlantic Monthly*, and other publications. And in 2007, in *The New Yorker*, he wrote an article called, "Slippery Business: the trade in adulterated olive oil." It drew attention to the distortions inherent in the olive oil business as well as the admirable and wonderful qualities of fine oil. And he's just written a book, that I'm sure he'll tell us about, called *Extra Virginity*, which explores the olive oil culture through the centuries and beyond. He currently lives in Italy and holds a B.A. from Harvard and a doctorate from Oxford, where he was a Rhodes Scholar.

Welcome.

MR. TOM MUELLER: Thank you, Senator Wolk, and thank you, Mrs. Boyd, for arranging this hearing, and Senators Berryhill and La Malfa, for being here today. I hope some of your colleagues arrive presently.

As Senator Wolk has said, I am a freelance writer, and I'm based in Italy at this time. I've been living in countries around the Mediterranean for the last twenty years. After my 2007 article in *The New Yorker* about the international olive oil trades—"Slippery Business"—I devoted a substantial amount of my time to learning more about this rich substance, and since then, have written a book, as Senator Wolk has mentioned—*Extra Virginity*—which was published last month, December 2011. While writing this book, I traveled extensively through the major olive oil production areas around the Mediterranean as well as in the Middle East, North Africa, Australia, and elsewhere, forming—or beginning to form—a global view of the olive oil industry. To write the final chapter of my book, I spent a month in California and have returned here twice since then, and I've had the privilege to spend time with a number of California olive growers, millers, oil traders, and importers; some of whom I'm glad to see again in this room today.

During my research and writing on olive oil in California and throughout the world, I've encountered again and again a strange paradox in olive oil. Olive oil is an extremely healthful, delicious, and high-value food; a substance considered sacred by many religions. And yet, the olive oil trade is plagued by dubious dealings and downright fraud.

As I discovered while writing my book, the positive characteristics of true extra virgin olive oil are many. Extra virgin olive oil is the healthy and nutritious center point of the Mediterranean diet, and medical research is beginning to demonstrate its effectiveness against a range of pathologies, including coronary heart disease, stroke, certain cancers, even neurological disorders, like Alzheimer's disease. And it's no wonder that olive trees and oil are considered sacred by many religions.

As a center point of most Mediterranean cuisines, olive oil also has enormous culinary potential. Here in California, top chefs and instructors at the Culinary Institute of America, in Napa, the world's largest cooking school, described premium olive oil as "the next culinary frontier." Olive oil also has great business potential right now in America, which recently replaced Greece as the third largest consumer country in the world in olive oil. The U.S. oil market is valued at about \$1.5 billion, with

10 percent growth per year. California, with its Mediterranean climate and agricultural knowhow, is ideally suited to growing olives and to supplying the demand for this oil. Olives and olive oil should be the next homerun crop for California agriculture.

Yet, here is the paradox that I mentioned earlier. Despite these marvelous qualities of olive oil and despite this apparently rosy economic picture, consumers are being deprived of good oil, and honest producers are consistently unable to earn a living because of distortions in the olive oil industry and because of outright fraud.

Although USDA and international regulations provide crystal clear definitions of extra virgin olive oil, a number of different products—some very good, some very bad—are being sold as extra virgin olive oil in America today. True extra virgin olive oil is the fresh-squeezed juice of the olive fruit. It is expensive to make. You need high quality fruit. You need to pick it and crush it quickly; store it properly in temperature-controlled conditions. But much olive oil sold in supermarkets is substandard oil made from low grade spoiled olives, which is cheap to produce and is sold as extra virgin at low prices that consistently undercut honest producers.

Systematic testing by the UC Davis Olive Center, but also, as Dan Flynn has mentioned, by Australia's consumer protection magazine *CHOICE*, by the regional government of Andalucia in Spain, by the food magazine *Der Feinschmecker* in Germany, and by other organizations, all underscore that a high percentage of olive oil sold as extra virgin do not make this grade. Many of these oils are actually lampante—or lamp oil—which, by law, cannot be sold as food but only as fuel.

Many olive oils, particularly in food service, aren't even made from olives at all. They are soybean, sunflower, and other low quality vegetable oils, colored green with chlorophyll and doctored with flavorants, then sold as extra virgin olive oil.

During the reporting from my book, I have met with undercover military police in Italy who describe widespread criminal networks involved in the production and distribution of fake extra virgin olive oil. I've traced the routes of tanker ships that meandered around the Mediterranean and the North Sea, picking up 3,000-ton lots of crude vegetable oil that miraculously transformed themselves—at least on the ship's documents—into olive oil before their delivery to south Italian ports. And these oils were subsequently purchased and resold to consumers by multinational food corporations.

The result of this kind of activity is massive quantities of substandard oil sold at bargain-basement prices as extra virgin, which defraud consumers and undercut honest producers. And this is by no means just a foreign problem. In fact, some of the most flagrant examples of olive oil fraud I've ever encountered occur right here in the United States—right here in California. In my book, I name a number of offenders, and I'd like to read one passage from the book to give a sense of the severity of the problem, even here in this state. This passage regards Italcal, a Los Angeles based olive oil company:

A former employee of Italcal, who is currently in dispute with the company, reports having observed extensive adulteration by the company. He claims that Italcal systematically lied about the nature and origins of the oil it sold and ignored traceability and other procedures required by the FDA. He speaks of a worker in the Italcal warehouse whom he nicknamed "The Gondolier," who he says blended up adulterated oils using a five-foot metal paddle, adding a coloring agent procured by the head of the company, Emilio Viscomi. Viscomi kept the recipe for the agent a closely guarded secret. "You want it greener? less green?" the former employee said. "You want it emerald green?" However you want it, that's how he makes it. The employee also describes Italcal's illustrious client list, which he says included some of the leading food distribution companies in America, whom he claims must have known the true nature of the olive oil they were buying, given that it was being sold at far below the market price of olive oil.

I find this situation outrageous. Clear laws exist on olive oil quality, adulteration, false advertising, food labeling, and so forth. But nobody is enforcing these laws. Not the FDA, not the state health departments, not one district attorney. Nobody.

Because of this river of cheap counterfeit oil, consumers are deprived of the health benefits they expect when they buy what they think is extra virgin olive oil, and in some cases, maybe eating products that harm their health. Because of this river of cheap counterfeit oil, honest growers, oil producers, and importers can't make a living since they are consistently undercut by low cost, substandard products. Add to this situation the fact that many of the false extra virgins imported from the Mediterranean

enjoy a \$6-a-gallon government subsidy and other economic aids from the EU, which mean they cost even less, and it is extremely hard for California growers and oil makers to survive economically.

The lack of a level playing field sometimes takes a heavy personal toll. In two cases I've encountered in California, it has driven an olive farmer into bankruptcy and severe depression. One of these cases ended in suicide, when the farmer hung himself from the limb of one of his olive trees. This situation will only get worse in the future unless decisive action is taken.

We are reaching a crisis point in olive oil in America, and in California olive oil in particular. I urge everyone in this room who is in a position to act to move quickly and decisively to enforce existing laws on olive oil quality and food safety and to tighten these laws in the future in defense of producers here in California and of consumers throughout America.

Thank you very much.

SENATOR WOLK: Thank you, Tom. Are there questions for anyone on this first panel? Or comments?

SENATOR BERRYHILL: Yeah, just briefly. I read your *New Yorker*—10,000 tons of Turkish hazelnut and Argentinian sunflower seed oil to Rigolio ended up as olive oil. How big a ... I mean, is this common practice, and is that part of the 75 percent problem that we've got coming through, Tom, or what?

MR. MUELLER: It was a bigger problem back when olive oil was a more valuable substance. The progressive doubt that has been injected into the market and the progressive sliding quality and increase in production have driven down market prices for olive oil to the point where right now in the open market in Spain, you can get a kilo—or about a liter—of olive oil for 1 (euro) 80. You can't walk out the door for 1(euro) 80 to make real extra virgin olive oil. And that olive oil is graded extra virgin. So there's a progressive dumbing down of the quality of the product which has led to sliding prices that, at this point, I wouldn't be surprised if they are adulterating hazelnut with olive oil.

SENATOR BERRYHILL: But that's happening over in Europe.

MR. MUELLER: And it's coming here.

SENATOR BERRYHILL: But it's coming here but it's happening in Europe.

MR. MUELLER: Right.

SENATOR BERRYHILL: So again, it begs the question, who enforces all this stuff? You would think it would be the USDA. But they're not?

MR. MUELLER: No. FDA has said, quite frankly—and one can sympathize with their predicament—they have an increasingly long list of items to deal with and an increasingly short budget, and they simply say, "We will not be able to look after olive oil for the foreseeable future." Now, I'm not sure—that might change, but I don't expect it to.

SENATOR BERRYHILL: It's obviously a problem. Dan, you mentioned 73 percent of the oils. Now, are these foreign oils, are these domestic oils too, that don't meet quality standards?

MR. FLYNN: Senator Berryhill, it was 73 percent of the top five branded imported olive oils labeled as extra virgin.

SENATOR BERRYHILL: So we obviously have a problem with olive oils coming across the ocean.

MR. FLYNN: One thing that I didn't mention is that in the U.S., we consume, total, maybe about 75 million gallons, and roughly 98 to 99 percent of that is imported because the California industry, just getting started, can only satisfy about 1 to 2 percent of that consumption. So it's primarily an imported market here in the U.S.—the largest imported market in the world, actually, for olive oil.

SENATOR BERRYHILL: This is a very quickly growing olive oil industry that we've got here in California, so the point of all of this is we want to protect our guys as we move forward.

MR. MUELLER: Senator Berryhill, I'd like to add that while it is a problem in imported oil, it's also a real problem in homegrown, or at least home-mixed, oil. It's by no means just a foreign problem.

SENATOR BERRYHILL: Okay, thank you.

SENATOR WOLK: Senator La Malfa?

SENATOR DOUG LA MALFA: Thank you. Thank you for your presentation on this. I've got a longtime background around olives and olive oil myself; with my last name La Malfa, you know, it kind of goes with it. My grandfather used to buy cases of it from the Oroville factory that was in Thermalito for a lot of years—Olio d'Oro. He'd give it away to all the family and stuff; cook with it. It was everywhere. We love the stuff.

But it's fascinating to me that I've heard other stats in the past that most people are buying and using olive oil not produced around here but in general just average off-the-store stuff that would qualify as rancid. So people in this country don't even really know what olive oil tastes like unless they've had the chance to try some of our nice products that are set up at booths and fairs, cattlemen's dinner the other night, and all this.

What do you see as the way to break out of this? We need stronger enforcement, I know, but what's going to shake people into doing the right thing on this? Are the fines way too small right now? I know Senator Wolk took a step last year, with last year's legislation, in getting this defined and all, but what do we need to do to really wake them up when somebody does get caught mislabeling extra virgin or one of the lesser grades? What would it take to shake up the bad actors in this?

MR. MUELLER: Well, I think certainly steeper fines and simply one prosecution. Frankly, that has not happened, to my knowledge, to date.

SENATOR LA MALFA: Not one prosecution in the U.S. on this?

MR. MUELLER: Well, in the U.S.—no. There have been a couple in the last fifteen years, but it's been almost laughable. I'm not aware of one prosecution in California. There may have been one, but I'm not aware of a major case. And I think that would send a shockwave, quite frankly, through the industry, because as we've said, it's not merely someone mixing up oils with a metal paddle in some warehouse in Los Angeles. It's the people he sells to, which are the major—some of the major food distribution companies in America, who then sell it on to hospitals, schools, nursing homes, and so forth.

SENATOR LA MALFA: They're demanding it, and somewhere they know what they're getting, right?

MR. MUELLER: I think so. I think it's safe to say these people are very good business people. They know what the cost of the market price of real extra virgin olive oil would be, and they're willing to, for the purposes of low cost, willing to close ... turn a blind eye.

SENATOR LA MALFA: What's the percentage of just average oil on the shelf in a regular supermarket that might fall into the "rancid" category?

MR. MUELLER: Well, I think ... I'm not familiar with the exact percentages of the UC Davis study, but ...

MR. FLYNN: Well, that 73 percent that we've been talking about was relating to that sensory defect that I described at the beginning. The most common sensory defect is rancidity. Another common defect is something called "fusty," which is a flavor that you get when olives are allowed to stay piled up before processing, where they start to rot and ferment, and then you get not a very good flavor from that. I don't know what it's like in wine, if you can do that and you get away with it. But with olive oil, it gives a defect to the oil. So rancidity was the most common one that we found.

SENATOR LA MALFA: What are the degrees? What's the highest as far as bad quality or even unhealthy? Is rancid the worst or fusty the worst?

MR. FLYNN: You know, I don't know if there's been much scientific research done on the negative health impacts of these defects.

SENATOR LA MALFA: Taste or health or just general?

MR. FLYNN: Yeah. I mean, they all have ...

SENATOR LA MALFA: Do I want rancid or do I want fusty if I have to have one or the other?

MR. FLYNN: Usually, you'll get both.

SENATOR WOLK: There was winey in there somewhere.

MR. FLYNN: Winey is a defect as well.

(CROSSTALKING)

SENATOR LA MALFA: These terms all sound like if we wake everybody up too early on Saturday morning ... (inaudible)

MR. MUELLER: I think it's important, though, to remember that these aren't just matters of food snobbery. They were established by the International Olive Council and espoused by the USDA and others, because these odd flavors and odors mapped directly to the chemical composition of this olive oil and directly indicate the quality, the health-giving properties, and flavor of that oil. So it's not just a matter of saying, "I don't like winey and fusty," but really, "How fresh is this fruit juice that we're eating?"

SENATOR LA MALFA: Now, is this something that the state needs to take up at its level, or can this be processed by a local district attorney when you bring this up? What can you tell us on that? What's the appropriate level, or where would we get the attention of this even?

MR. MUELLER: Anywhere it will be dealt with I think is the appropriate answer. So far, there has been little traction on all levels, but anecdotally I believe that all three of those levels are appropriate avenues to approach this.

SENATOR LA MALFA: Thank you.

SENATOR WOLK: You're welcome.

We know that from our background material that we shared that there are some states that have acted in the enforcement area; Connecticut being one of them—their Department of Consumer Protection. So I think as we move forward, I think both New York and New Jersey also have had more active efforts. In Connecticut, they ordered the food inspectors to test the product. And there was a great deal of publicity about that; and probably of the result as well. So it seems to me that that might be something that we might want to take a look at with respect to California.

I have a question about the health impacts. And you didn't focus a lot on that, although you did mention it. It would be helpful to have a fair amount of good research as we move along with supporting the industry with respect to health impacts. We know that it makes a difference but we need more, it seems to me. And we're very well positioned, it seems to me, with UC Davis, which has the School of Nutritional Biology, and Food Science, and Technology, and a medical school, and a vet school. I mean, it seems to me that they should be interested in partnering with the Olive Center on doing some of this research. What do you think about that? Has there been any effort to do that? Do you think that's an area perhaps this subcommittee could encourage?

MR. FLYNN: Yes. I think that would be great if the subcommittee could encourage it. We have done some initial exploration of this with the Med Center and we've had some discussions with their chief of immunology on the health impacts of olive oil. There's quite a bit of interest. And as you know, there's different levels of validity for these kinds of health studies. And the most, sort of, the gold standard is a clinical trial which can get pretty expensive. So we've been exploring. And I think the question is trying to figure out how we could get it funded through the nonprofit foundation—somewhere where we could get some funding for it.

I don't get the sense at this time, that the California industry, this is a priority for them. I think they're more concerned about some of these quality issues.

SENATOR WOLK: And their direction is looking at the marketing order, I believe—for the federal marketing order at the moment. But it seems to me, that one of the issues in terms of consumer protection is one of the reasons people are going to olive oil is because of its health benefits. So the consumer is not getting what they pay for and that, it seems to me, is a good argument that would encourage enforcement as well.

MR. MUELLER: Yeah. The FDA allows a partial health claim on olive oil bottles saying, “Eat this because this is good for your heart,” but they’re not verifying what goes in the bottle. It seems to me, that’s a fundamental difficulty.

I think your question of health is extremely cogent and important in this and needs to be—I’m not a food scientist—my understanding in the matter of low grade olive oils that are being passed off as extra virgin, that “rancidity” implies free radicals, implies peroxides, implies things that are not healthy inherently for a body. And as you say, if someone reaches for extra virgin olive oil thinking they’re going to get the Mediterranean diet in liquid form and they get this other stuff.

But clearly, with adulterated oils, we’re dealing with a whole other level of risk. I mean if someone has an intolerance to peanut oil, soybean oil ... granted, refinement usually removes that—all of the proteins that are responsible for allergic reactions—but if you’re dealing with someone who’s willing to do this, how good a quality control can you expect from them? So I think those are the two, kind of, branches of this question.

SENATOR WOLK: All right. I want to thank both of you, not only for coming today, but certainly for all that you’ve both done in terms of raising the profile of the olive oil industry and the benefits of olive oil, and challenges still in front of us. So thank you both very much.

MR. FLYNN: Thank you, Madam Chair.

SENATOR WOLK: I’d like to ask those who are on the second panel to come forward: Adam Englehardt; Brady Whitlow; Brendon Flynn; Jim Etters; and Mike Bradley. This is the California Olive Oil Industry Perspective.

And as they’re coming forward, I’d like to tell you that the Olive Oil Subcommittee has a very, very eminent advisory committee who will be advising us on some of the solutions what may well involve legislation or other policy approaches as

we move forward. And we have some members who are with us—and I don't have the list. I will in a moment.

So we have our second panel and I'll talk about the advisory committee in a moment. But let me welcome the second panel. First of all—Adam—welcome. Adam Englehardt is the vice president of Orchard Operations for California Olive Ranch. He manages the operations of five thousand acres of company orchards that are planted in Arbequina, Arbosana, and Koroneiki. And in addition to the California Olive Ranch orchards, Adam oversees grower relations and the purchasing of fruit from an additional ten thousand super-high-density orchards in California which deliver, again, to the California Olive Ranch processing plants. He's a fifth generation California farmer from Artois and a graduate from Cal Poly, San Luis Obispo. Welcome, Adam.

MR. ADAM ENGLEHARDT: I'd like to focus my remarks on the growing aspect of the industry. There are those in this room much more qualified to discuss the chemical properties, standards, and some of the market dynamics in terms of trade. But as we look at the California industry ... as Senator Wolk mentioned, I'm a farmer of not only olives, of other commodities and consider myself a farmer by choice and by profession.

And as you look at the California industry in recent years, right now by our count, there's about 28,000 acres of super-high-density olives purposed specifically for olive oil production in addition to a large amount of acreage for table olive production. That acreage is growing and it's growing considerably. But I think what really stands in the way of a much more rapid expansion—as mentioned by Senator Berryhill—similar to the wine industry or almonds and walnuts, is the lack of a level playing field for marketing of a California product.

And I think one thing is important to make clear in the conversation is that the U.S. is a very large market and there is a lot of very high quality imported oil that exists in the world today. However, like the California producers of high quality oil, those quality producers of imported oil are facing the same challenges in that their product is not being valued as a true extra virgin because of the dilution of that category with some of the lower quality oils.

And again, if you look at oil production in California, olive growing in California, it's really a question of highest and best use. The olive tree, especially one grown for

olive oil, does not need a lot of water and that fruit size is not inherently important to yield. The tree itself is very tolerant of adverse soil conditions, including salinity, high sodium counts, as well as drainage conditions, gravel, and soil profiles. So it's a very tolerant crop and very well suited to a lot of areas that might not otherwise be profitable for intensive agriculture. So I think where you see the olive really fitting into the California farming climate is in these areas that were historically used for either grazing in a lot of cases, or had been used in other crop rotations but without maximizing that yield or using an excessive amount of water; where an olive can go into an area and in most cases use just about one-quarter of the water demanded by some of the crops that had been growing there previously. So looking ... as you mentioned, the water debate that is currently raging ... as you look up and down both north of the Delta and south, there are very substantial areas of land that would be extremely suitable for olive production while using about a quarter of the water that is now demanded by the current crop, and will also be tolerant of a lot of the salinity issues that plague much of our southern San Joaquin west side districts.

And again, what stands in the way of this expansion is not the suitability of that crop or, I think, the ability of the California industry; it's that if you look at the gross return, or net return rather, to a farmer to an acre of olives and in particular—as my area of expertise is in super-high-density—the return on investment in super-high-density right now is not conducive to massive plantings. And the reason that is, is that that oil price is being held in check because of the worldwide oil prices as low as Dan and Tom both mentioned.

Were that ship to be righted ... and I think it's important to say we're not looking for protections to give us an advantage over other producers. I think what I would simply ask is that we have a level playing field—I think as Tom mentioned—in that all product being sold in the United States, in California, be subject to a true testing regimen and be held to a standard across the board and that standard be enforced. I think if that were to take place, you would see some increase in the pricing for olive oil both at the retail level and also, as it would trickle down at the farm gate; that would initiate much more rapid expansion of plantings.

Already—I think I mentioned—that despite all these challenges we mentioned, the expansion has been pretty rapid. And I think most encouragingly, we're seeing more processors, vertically integrative larger processors, as well as smaller processors

and growers, entering this market. I mean a lot of them are sitting at the table here with me today. So it is a vibrant and growing market that I think could be much more so with the creation of a level playing field.

SENATOR WOLK: Thank you, Adam. I think we'll wait on questions until we hear from everyone. So let's see—our second speaker is Brady Whitlow. And Brady, let me introduce you. You're president of Corto Olive, located in Lodi, California. This five year old company grows, mills, and markets extra virgin olive oil from super-high-density plantings. With an annual capacity approaching 500,000 gallons of extra virgin olive oil, Corto Olive is positioned to have a significant impact on California's emerging olive oil industry.

Brady has spent most of his career in the sales and marketing of specialty food products. He has a B.A. from the University of Oregon and an M.B.A. from Santa Clara.

Brady—you're on.

MR. BRADY WHITLOW: Thank you, Senator Wolk. And I'm very pleased, Senators Berryhill and La Malfa, that you're here. This is a big step for olive oil, California olive oil specifically.

Briefly by way of background—no, Whitlow is not an Italian name. I'm IBM (Italian by marriage). Our family (I married into) is Italian—Cortopassi. We've been in the agricultural business for four generations now (since the twenties), both in large scale farming—we have about 10,000 acres—and food production—tomato cannery, as well as now an olive mill. So we go into this with our eyes wide open.

We know what California agriculture is all about. We're not doing this so much as gentlemen farmers—although we do love olive oil—we're doing this as a real business opportunity. We see the future of a new viable crop in California that will give growers an alternative, a good alternative, to grapes or almonds or walnuts, what have you. And so, we went into this, again, eyes wide open in a big way. We've invested significantly in not only the mill but in plantings, believing full-well that this is a viable business proposition for us, but for many California growers and for California in general.

The frustrations we're experiencing, however, are causing us to question our original ideas. We're certainly not going to give up on this. We're all in and we're all in

it for the long run. However, the state of the industry is disappointing—and Tom did a wonderful job of spelling that out for us.

As Adam said, we can't make money if the cheaters are allowed to continue to cheat. And all we ask for is a level playing field at the fair price for what's called for—what should be extra virgin olive oil. We can make a go of this industry in California; plant thousands more acres, invest in more mill and equipment, and provide lots of jobs. This is a viable industry if we can put in some standards that are enforceable.

But as California starts to get on the map and create some size to get the attention of the importers ... remember, we're one percent now; we've doubled in size. We're two percent of consumption in the U.S.—we're starting to get the attention of these big guys. And they have all the money, and they have all the power, and it's going to be very difficult for us on our own to stand up against them because they are cheating. They're sending us bad oil and they're not playing by their own rules.

So how do we get that level playing field? Well, that's why we're here. So that's what we're asking for. Thank you.

SENATOR WOLK: Thank you. Brendon Flynn is a third generation farmer who was born and raised in Tehama County in Northern California. Pacific Farms was originally started by his grandfather in 1952. Brendon holds a B.S. in Agricultural Business from Cal Poly, San Luis Obispo. After working in many different areas and disciplines related to agribusiness, Brendon decided to return to his family's farming operation to pursue a career in production Ag. He is currently the president of California Olive Oil Council.

Welcome.

MR. BRENDON FLYNN: Thank you. Thank you, Senator Wolk, Berryhill, and La Malfa. I appreciate you giving us the opportunity to be here today to discuss what is becoming a more and more important industry here in California.

I am here representing the California Olive Oil Council. A little background: The California Olive Oil Council will be celebrating its 20th year in existence this March at our annual meeting. And so, by virtue of that fact, you can realize that this is not a new issue or a new—relatively new—industry for California. There was a resurgence of production of olive oil prior to twenty years ago. And it took a group of pioneering individuals to get together and to establish this voluntary grower-producer based organization to address, to try to communicate to the general public, and primarily

consumers, the qualities of California olive oil and the relative benefit of that to the consumer. So something that's been an ongoing issue and continues to be and some of the issues have been well laid out here for us today.

You mentioned 400 growers or producers; the California Olive Oil Council represents over 400 of those folks. Not only producers but other interested parties of the industry—retailers, food professionals, and the like. There are over a million gallons—1.4 million gallons is the estimate for the 2011 crop. We're looking forward to over two million gallons in 2012, and a very rapid expansion after that in the near future. So this is an industry that will continue to grow as new plantings come online, driven primarily by super-high-density plantings, which are, if you're not familiar, sort of the grapevine planting style that Adam mentioned. But that is not to say, that there is not a very significant portion of the industry that is represented by smaller producers on what we'd call a little more traditional spacings or more traditional production style; and multiple varieties.

You mentioned 50 varieties of olive trees producing oil. There are literally thousands of olive varieties in the world and all of them can produce oil. And we continue to see more and new varieties represented here in California. So it's a very varied representation of the industry; from very small producers of a hundred gallons or less all the way up to producers of a million gallons or more. So you see a lot of different viewpoints.

But all of these producers and those who are passionate about olive quality and olive oil production are rallying around the same issue you're hearing here today which is that quality. In order for the consumer to really receive the quality that is purported on the label and in the bottle, we will need to have some assistance to have strict adherence to the standards which are very well established internationally and are being refined—more and more refined ... or not in the sense of refined olive oil, but refining of the standard on a continual basis. As science improves, as the producers of olive oil improve their ability to analyze olive oil, we're able to very clearly, very quickly, and very concisely, differentiate the good from the bad.

An existing term that really represents the good in the olive oil industry is "extra virgin." And that's not to say that all olive oil that is not made extra virgin grade is bad, but it is not extra virgin. And if it is not extra virgin, it should be not be purported to say so—to be labeled as such. And it's what Adam was talking about;

that it's not inexpensive to create good high quality olive oil. And he touched upon the health aspects.

Olive oil is a fat in the end and it is used as such in our diet, but it is a relatively good fat for us. However, as olive oil degrades it does lose some of those positive properties; polyphenols, antioxidants, omega-3s, and things of that nature ... I'm not a scientist by trade but I can throw some of the lingo out there; there are those who are better suited to speak to that. And that science does exist and like I said, it's continuing to develop and I think you'll see that we can clearly define what makes a good olive oil not only good in flavor, but good in health properties as well. And the consumers are desiring that and should be able to get that if that's what they think they're paying for.

So the California Olive Oil Council, again, a purely voluntary organization but it is well supported by its members. But a real stumbling block is a lack of funds. We are continuing to gain steam, however, it is a very expensive proposition to communicate with the consumer in the United States and communicate with them in a proper and meaningful way. And those types of dollars are difficult to come by when the operators—the processors, producers—are operating at breakeven or below breakeven pricing back to the operation. So it's sort of a chicken-and-an-egg issue here; we don't have the dollars to be able to communicate and we can't get the dollars to communicate until we are able to get the consumers to realize the true value of the product.

Again, looking forward to working with the California legislature on a statewide basis. But we're also endeavoring as an industry to continue to communicate on a national basis and international basis, as will be represented here later today with folks who are producing, again, high quality olive oils throughout the world.

SENATOR WOLK: Thank you, Mr. Flynn.

Mr. Etters—welcome. He is the director of land management for the Yocha Dehe Wintun Nation located in the Capay Valley—beautiful, beautiful valley. He is a Yolo County native and he oversees more than 11,000 acres of tribal land, including a diversified farming and ranching operation, habitat restoration, and grant work, a tribally owned winery, and a 250 acre organic farm. He has spearheaded the Tribe's vision of starting its own line of premium agricultural products under the Séka Hills brand.

In 2008, he advised the Tribe on planting the first large scale development of super-high-density olives in the Capay Valley.

In the summer of 2011, the Tribe began construction of the Séka Hills Olive Mill, a state-of-the-art mill that will produce premium olive oil from the Tribe's harvest and also offer premium local milling for other Capay Valley Olive growers. The mill will be ready for production pretty soon—the 2012 fall harvest.

So welcome.

MR. JIM ETTERS: Thank you. Thank you very much, Madam Chairman and subcommittee members, for inviting me here to participate today. The Tribe's story in agriculture in olive oil is a little bit different than most of the other growers and participants you hear today. The historical habitants of the Capay Valley—the Yocha Dehe homeland—is at the heart of the Tribe's culture and heritage. The land has always sustained this tribe and it is from that land that we have grown this agricultural business.

Today, the Tribe takes great pride in managing more than 11,000 acres in the Capay Valley. The Tribe is focused on sustainability and responsible stewardship. It's committed to preserving its land for future generations.

We currently farm a dozen different crops: wine grapes, walnuts, almonds, alfalfa, wheat, oats, safflower and sunflower, just a few. We farm 250 acres of certified organic ground and recently planted blueberries and asparagus on that land. We also run 200 head of angus cross on the Tribe's native oak range land. But perhaps the most exciting crop that we're growing now is olives. We have 82 acres of super-high-density olives and we plan to plant 20 acres of medium-density varieties—picual and taggiasca—this spring.

So why olives? About six years ago, the Tribe purchased 90 acres just outside the town of Guinda. And this land had poor soils and limited water supply, like we talked about today. We used it mostly for grazing cattle but once we looked at options for putting this land to better use, we realized that olives were a perfect fit. We planted our first planting of super-high-density in 2008.

Today, we are beginning to sell our own oil under our own agricultural products brand, Seka Hills. In the Tribe's native Patwin language, Seka means "blue" and the blue hills run along the western edge of the Capay Valley. Our excitement about Capay Valley olives is based on our belief that the climate and the soils are almost

perfect for growing top quality fruit. And as we all know, great oil starts with great fruit. But to preserve freshness and create the highest quality oil, that fruit must be milled in a reasonable amount of time. But we quickly realized that what other Yolo olive growers had long known, the lack of an olive mill in Yolo County was a significant challenge for our young industry. As a result, we have just about finished building our own Seka Hills Olive Mill—state-of-the-art equipment. Starting this fall, we will mill our own fruit within just a few miles and minutes of where it's grown. We also wanted to provide the opportunity for other local growers to use this state-of-the-art equipment in our facility. The Tribe really has a passion about working with growers in the western Yolo County in the Capay Valley.

Our mill will have a tasting room lounge that will feature the Tribe's products along with other products from the valley. Agri-tourism has a growing potential in the Capay Valley. And Yocha Dehe is one of many growers excited about the prospect of building the reputation of the Capay Valley as one of the premiere olive growing regions of the world and bringing customers out to our farms to taste the product and hopefully purchase some also.

The Yocha Dehe Wintun Nation looks forward to working with all of you in the development of the California industry. It is really exciting to be a part of it. Thank you.

SENATOR WOLK: Great. Thank you, Jim.

Our last speaker, Mike Bradley, is the president of Veronica Foods Company which was established in 1924. He's an olive oil expert, enthusiast, organic producer, and importer. He's an advocate for stricter quality standards, I'm told. Welcome, Mr. Bradley.

MR. MIKE BRADLEY: Thank you, Senator Wolk. Thank you, Senators. And thank you, panel. I can't begin to tell you how amazed and grateful I am for this day. It's been a long time coming. My wife's family and my family have been in the olive oil business since 1913, and we have struggled, and we have struggled mightily, against what some of the speakers have pinpointed before me and if I could, I'd like to kind of summarize that so we can get a clear and simple view.

The Four Horsemen of the Apocalypse here. But what we're really up against ... and I thank Adam for pointing out that these monsters are not just affecting California, they're affecting all producers in the world who are really trying to create

and make an authentic business around olive oil. And they are, in order of importance, the subsidy. There is no company in the world outside of Europe who can make olive oil, any kind of olive oil, including the lowest grade that we can talk about, at the current world market price. It's not possible.

Tom mentioned earlier in his talk about that \$6 a gallon. What does \$6 a gallon mean to you in your operation?

MR. MUELLER: About 40 percent of my cost.

MR. BRADLEY: Okay. It's the same for Tunisians. It's the same for Moroccans. It's the same for Turks. It's the same for anybody outside of the EU. It's simply not possible in the world to make a profit and produce olive oil against the European subsidy. That's number one.

Number two—and that's been touched upon here—is we have standards. Really, what we have is lack of standards. The grade that's been described as “extra virgin” is a bad joke and everybody who is in the business knows it. It's the dirty little secret that they whisper about in the corners. And everyone knows that the oil, a great majority of the oil that's not just coming into the United States, it's off the shelves. Somebody else pointed out that two people went to jail here recently in Spain—at two companies, you know? The standards are a joke and they are abysmal. And they really need reform—desperate reform. So we've got subsidies and we've got standards.

And then someone else mentioned, and this is no small problem, is fraud. We've got a major problem with fraud. Fraud, as you know, is corruption. Corruption is infectious and when it goes untreated it travels through the veins into the capillaries and it infects every single aspect of this business.

I brought with me some samples. I'm going to talk about them. But I picked samples that are just a wide variety of the things that we've encountered over the last ten years. And every single oil and every single test that my company has made, we have made agents at FDA in California ... where over ten years ago we went and we basically, with one of the largest wholesale distributors in the United States, we sampled their product, we tested their product, and we proved that every single product that they were selling in that store was either adulterated or counterfeit. And we brought that information, and we presented that information, and nothing ever happened. So that's three.

And the fourth one—and this is really important—is education. Senator La Malfa mentioned that many people don't understand what good olive oil is about and how should they, how could they, when the bulk of what they're consuming is defective? How are you supposed to learn? And so, what I think someone from UC Davis here recently came to the conclusion after a study, that many Americans actually prefer the defect that we've been discussing called "fustiness" or fermented olives because that's what they've been used to tasting.

My experience has been contrary to that in this regard: When Americans, like the rest of the world, when they're given the opportunity to taste really authentic well-made olive oil next to fermented; they always chose the right thing. They get it immediately because they understand what "fresh" means. And there's no way that when you're tasting fresh well-made oil, that you miss it. There's no way to describe the word "fresh." I mean you know it when you smell it and when you taste it; and well-made olive oil, you can taste it there. And some of the defects are a result of ... the largest single defect—I think Dan Flynn pointed out—is due to rancidity, which is age.

Now think about this for a second—this is one of the largest crops in human history. The Spanish alone have 470,000 tons of olive oil that they're bringing forward from last year. It's already a year old. And I can tell you as a buyer, the best olive oil sells first. So what's left is what didn't sell. Now this olive oil is going to be carried over into this crop and this crop is a million-five-hundred tons in Spain alone. The rest of the Mediterranean, when you throw everybody in, we're looking at about 3 million tons of olive oil, with most of it accompanied by a subsidy. There is just absolutely no way in the world that California, or anyone else outside of Europe, can compete against this. It's not possible. And as Brady pointed out, it's not a level playing field.

No doubt in my mind whatsoever that California compete. No doubt in my mind that California is going to be a player. Eventually, we're going to get this. And we're getting it now. We've got creative people. We've got smart people. We've got young people. And they're going to be the future provided you guys level this playing field and make it possible for not just Californians, but, you know, there's people in Georgia that want to grow olive trees.

And again, I want to thank Adam for pointing out that this is ... one of the big difficulties in history is the provincial nature of it. And if we fall into the same trap that the Europeans have and we become chauvinistic about it and we try to make special rules and we say that we're better than them because we're here, it's a big mistake. We've got to be honest and we've got to hold ourselves to the same standards that we want to hold others to. And good olive oil, well-made olive oil, anywhere in the world we can compete with provided that subsidy is taken away.

Now I'm going to stop.

What I brought with me ... I want to show some very basic examples of the kinds of things that we run into on a daily basis. And as I hold them, I'll describe them.

I'm going to go through these one at a time.

This is a can. It's called Cassolina(?). It says, "Pure olive oil. No cholesterol." It's got a very nice picture. "Imported from Italy," on the side of the can. And if you flip the can around it's got a distribution clause that lists the name of the company in Redwood, California with the zip code 94065. The name of the distribution company is F as in Frank, C as in Charley, G as in George, P as in Paul (FCGP). There is no such company. They don't exist. You can't find them in the telephone book. You can't find them if you call the operator. This is counterfeit olive oil.

We run into this kind of ...

SENATOR BERRYHILL: A quick question. So in all likelihood that's probably not all olive oil in that can?

MR. BRADLEY: I have an analysis on this can. And you're right; it's not all olive oil.

SENATOR BERRYHILL: Okay. Thank you.

MR. BRADLEY: Here's another can. This is called ... who say's counterfeiters don't have a sense of humor? This is called Caputo. Caputo Olive Oil Company: pulled, pressed, imported from Italy. And this company actually does exist. You can actually find them on the internet. I have an analysis. The reason why I brought this can is they're also in the food service business, and they pack a 35-pound—what's known as a JIB. If you go into Costco, you go into a Restaurant Depot; you'll see those large plastic jug-in-a-box.

And a local wholesaler came to us and said, "Geez, we'd like to get some good olive oil."

And we said, "Well, what are you using?"

And they said, "Well, come and get a sample." And so we picked it up and brought it in and this was the brand they were using. And the JIB, 35-pound JIB, no pack date, no lot code, no ingredients, no nothing. Took off the cap; no tamper proof seal. Open, right? To open it and there it is. Had it analyzed—sunflower oil. The percentage we don't have exactly, but we had it analyzed at Modern Olives (for my money the best lab in the world)—counterfeit.

Now just imagine for a second—if these kinds of people are willing to do this in a restaurant chain, and just in food service institutional business, what's happening on the industrial level? Nobody has talked about that today. But if you go into any store and you look at the products like spaghetti sauce, pesto, there's hundreds of them now that have olive oil in them. Imagine what's happening on that industrial level—tankers going down the road.

Here's another one. This was sold at a ... this is called Supremo Italiano. This was sold at Restaurant Depot. I don't know if they still have it. I picked this sample ... this sample is about seven years old. This is when I first went to Food & Drug in California after shopping in their store. One of my salesmen came to me and said, "Mike, there's no way I can compete against this stuff. We cannot sell oil at this price; it's below our cost." I said, "Go get some samples." We took the samples down and sent them out to the labs. This came back as mostly pomace olive oil.

In the interest of saving time, I don't want to go into a lot of discussion about this, but there's been this discussion about seed oil and oil made from something other than olives and somehow it's considered a more egregious sin to take that, say, sunflower or soy or canola, and mix it. And I tell you that if you take a look at what they're ... there's a reason why refined olive oil is a legally different substance. Somebody mentioned it earlier here. There's really only a couple of reasons why I didn't want to buy olive oil. One is the flavor and one is the nutrition. Refined olive oil has no flavor—not a little flavor—it has none. In the refining process all of the flavor is removed—100 percent. And the antioxidants that the people talk about, the doctors talk about, and that the government recommends; they're destroyed as well in the refining process. So I'm not saying that refined olive oil doesn't have some benefit and

some uses; it certainly does, but it's a totally, legally different substance than extra virgin.

And so, from my point of view, if you're mixing refined olive oil with extra virgin or you're mixing a lower grade called "pomace olive oil" made from the pits and skins, what's the difference between that and mixing with sunflower? It's a legally different substance. It's fraud. And this is the problem. So there's three.

This one is really interesting and I brought it because it's a great example. If you look at the label—and we'll pass this around—if you look at the front of this label it says, "Italian extra virgin olive oil." Flip it around and here's what it says on the back: "Extra virgin olive oil; Mediterranean style blend. Ingredients: Vegetable oil, and up to 65 percent extra virgin olive oil." We haven't had it analyzed yet. We will. Our guess is 5 to 10 percent. This is in grocery store shelves in Southern California today.

SENATOR LA MALFA: The first item on a label usually is whatever the highest amount of ...

MR. BRADLEY: The law says the first ingredient listed on a label must be the one of greatest purpose.

SENATOR LA MALFA: There's no way it's 65 if the other product was first.

MR. BRADLEY: Okay, here's an example now—this is an olive oil. It's an authentic olive oil; an extra virgin olive oil that just sat under fluorescent lights for about four months. And you can see that it's an amber color—kind of the color of beer. Every extra virgin olive oil, if you leave it and you let the lights affect it, if you expose it to UV, it will turn this color. Again, about six months.

This is an olive oil we call "ever green." This has sat on my desk for seven years. (Laughter) I'm not exaggerating. It has never turned color. Industrial dye—Tom mentioned it. This is the kind of fraud. Now what is this industrial dye? What is it made from? What effect does it have on people? No lot code number. No date code. No nothing.

And then lest you think it's just the big guys and the bad guys; this is oil from a boutique olive oil store—brand new olive oil store. This guy—one of these says "organic." It's got sunflower oil in it—pardon me—canola oil in it. And he claims on the internet that this is the exact same oil used at the French Laundry by Thomas Keller. And nobody says a word. It goes by.

So again, these are some examples I brought with me; some lab analyses I plan on sharing with the Senators after the meeting. And if anybody would like to ask questions about this, I'd be happy to answer it. Thank you.

SENATOR WOLK: Thank you very much, Mr. Bradley. Thank you very much. Questions of the panel? That was a great presentation. Senator La Malfa.

SENATOR LA MALFA: Thank you, Mam. When you want to get to the point where you can rely on the label and rely on what you're getting as a consumer as well as what growers are relying on, that they're on a competitive playing field, that extra virgin is really extra virgin, and that the good name of olive oil is being held up by the product that the consumer is buying, as growers and processors how far do you want government to go in requiring labels or requiring samples to be tested? To what extent are they tested, like, under an electron microscope? How far do you go to detect, if there's rancidity? Or do you have to differentiate that the other oil is being mixed in? Or actually this is sunflower or just some other foreign substance of type of oil? Because, you know, there is a balance there of how much you have to do to verify what you've produced. Does it need to be every vat? Every lot? Or do you want to go more to a random sample thing where anybody from a regulatory group can come in and grab one sample and pull it; run all those tests and have the spot check be the deterrent to anybody out there producing? How high or how low do you want to go with labeling and samples and depth of sample?

SENATOR WOLK: That's an excellent question.

SENATOR BERRYHILL: Just to add to that—has this panel and has the industry thought about a comprehensive ask here today? Because, I mean, we're sitting here ... obviously a lot of this stuff is just outrageous. I mean, just unbelievable. This is the most interesting informational hearing I've ever been to. And obviously, something needs to be done here. And when you talk about a level playing field, obviously you're not on one, but we've got to think as a group here and as a team what we do about making it fair and making it level? And I guess to just to add to Senator La Malfa's questions, have you thought about a comprehensive fix here on what you might need?

MR. BRADLEY: Let me start with that. I'm sure Adam will add. I'm really not worried about how far government is going to go at this point since we have nothing. So I mean, anything will be helpful. (Laughter) I knew I would get a reaction out of

Mike there. But to be serious: We are very confident in what we're doing. We're willing to do any testing that the industry comes up with.

The California Olive Oil Council has a seal and a standard and a testing protocol that we're happy to abide by and would be happy to bolster it—make it even stronger.

SENATOR LA MALFA: But to follow on that—I'm a grower of crops too, and it's a different deal—but government can make requirements that you would have to test every vat to such a great extent that each test sample, to run it through a lab would be, maybe, a lot more expensive than what you want. I know we all want to reach a goal here, but to what level of testing or labeling is one that's going to be economically good for you to ensure the standards that you want but not be wishing, you know, five years from now, "Man, why did we go down there and ask for that? I can't afford it as a grower or as a processor," etc. So the balance you're looking for, and maybe it's a fairly low-level of number of samples taken, but just a great big fine on the other end for anybody who's found committing fraud or not holding up ... you know, a huge fine that scares the heck out of the bad actors. So please.

MR. ENGLEHARDT: I think one thing we've looked at—and Brendon addressed—is the COOC has been around for how many years?

MR. FLYNN: Twenty.

MR. ENGLEHARDT: Twenty. And one of the things I think the COOC was most instrumental in doing is establishing a California—a voluntary COOC standard that many growers adhered to. And this was fairly effective in policing ourselves to some degree. The advantage we have at this point is, because it is a fairly young industry, much of the infrastructure and many of the plantings are set up in a way that can easily produce a quality product.

But again, to address some of the issues that you brought up Senator La Malfa. Last week in Dixon we actually had a meeting that was very well attended with over 300 grower attendees to discuss a federal marketing order draft that would deal specifically with the establishment of a standard and provide for an assessment of domestically produced olive oil that would, then, create a funding source for the development, promotion, and enforcement of that standard. And as most of you are familiar with as growers of other commodities, most other large commodities in the United States as well as California, have entered into voluntary marketing order

programs based both on a federal and state level. And in most cases, those marketing orders' primary purpose is to establish a grade of trade for a product. So I think we have many avenues and possibilities for correcting this problem.

It is my personal belief that the establishment of this marketing order on a federal level is going to be the most expeditious route to dealing with this problem, and essentially creating a law that the FDA and USDA would then be required to deal with.

The challenge we will have at that point, is the initial marketing order would apply only to domestically produced product. At that point, we would then need to apply for an AE order, which would apply those standards to any product sold and marketed within the U.S., which would then establish a level playing field.

And I think as Mike alluded to; we would like to see, as part of this marketing order, we would like to see the standard be fined and updated to utilize some of this new chemistry. But even if the current standard recently adopted by the USDA—which is a voluntary standard—were to be enforced through regulatory channels or through a marketing order, I think it would be our best step to correct the issue. My opinion.

SENATOR LA MALFA: Would you anticipate that this would end up with the label, the Good Housekeeping label or the UL label, you know, your version of that that says, "This is good oil," and the consumers would differentiate that between what you have? But also, consumers shop price, so they might look at the one that has the good label on it but still see the cheaper stuff here. So how far do you want to go with the enforcement? That it's not even imported or allowed to be sold on our shelves, or that people have to decide, "Well, I want the good stuff that we know about or I can still buy the cheap stuff?"

MR. ENGLEHARDT: Well, there's others I think that can speak to the consumer preference better than I can. But I think one thing is certain; that the consumer in the U.S. does recognize extra virgin as a premium category of trade. That being said, I think if a standard were passed that would then ensure through inspection and testing that what is labeled as "extra virgin" is in fact extra virgin.

So you asked the question about what is the frequency of sample? And I think we have a significant precedent that's been set in many of these other marketing orders, as well as the import food safety law recently passed, that sets a standard for frequency of sample as a statistically relevant number of samples by container type by

volume. So there is some precedent there in language that's in place in other orders that would require processors or handlers, as they're defined in the marketing order, to ask for—prior to the sale of a product—the USDA or a representative of the USDA inspection service, to collect samples from a statistically relevant number of those containers that would then be verified that they are in fact ... meet the quality grades that they're being sold and marketed as.

MR. WHITLOW: I'd like to add two things real quickly. One, you're going to learn a lot when you hear from Paul Miller from Australia. The Australians have taken a strong lead in the world on this problem and they've developed a very good standard with a lot of good thought into it.

To the point of cost: some of the new methods for adulteration, whether it's adulteration from pomace oil—olive pomace—or other oils, are much less expensive than they have been so we may be able to get to a point where we can test—and again, Mr. Miller will speak to that.

The other thing relative to the extra virgin versus others—and Dan Flynn alluded to this—there's a need and a use and a desire for non-extra virgin olive oil. That's fine. We embrace that. We encourage it. The rest of the world uses virgin oil. That's not our problem. We just don't want them to call extra virgin, or non-extra virgin oil, which doesn't cost much ...

SENATOR LA MALFA: Would you remind me again; extra virgin is that first squeeze and then virgin is when you've taken ... I mean, it's still one thing when it's all olive oil. You don't want garbage in it. You don't have rancidity or any of that other stuff. If it's all good oil, you just have extra virgin and you have virgin that is maybe the second pass through the olive, and that's still good oil, right? I would still buy that as a consumer and maybe if I was shopping price or whatever, yes?

MR. WHITLOW: I'm going to let Mike handle that question because it's a complicated question.

SENATOR LA MALFA: And the other half of that is, can you detect in testing for extra virgin versus—good extra virgin versus good virgin, can your processes ...

MR. WHITLOW: The answer is yes, you can. And again, there's a lot of nuance ... after you get past extra virgin there's a lot of nuance because there can be good virgin and really bad virgin. So I'll let Mike ...

SENATOR WOLK: Mike, do you want to wade into that?

MR. BRADLEY: Again, and the panel has touched upon this. We can talk about this at a later time because it really is complex, and it's one of the difficult problems of trying to make a simple solution to such a complex problem. But chemistry is huge. As Brady mentioned, the Australians and—with the help of the Germans by the way—Christian Gertz, the German chemist who, in an effort to stop the flow of really bad oil into Germany, was the guy who really brought to the fore these two new tests called DAGs and PPPs which detect slippery business. In other words, they detect soft column refining, which is a way that you can take oil that's lampante; you can refine it and it goes undetected by current IOC tests.

Now the question of extra virgin—and again, I don't want to get too far afield on this thing of refining—but the question of extra virgin, it's such a huge category and it's one of the problems. It's a pass or fail system. And if you pass by the skin of your teeth, if you get a D-minus-minus, you still are an extra virgin. It doesn't matter if you won a gold medal at the L.A. County Fair and you got an A-plus-plus on both your chemistry and sensory, you're still only an extra virgin. And this is part of the problem.

Companies like the folks sitting here at this table, and many others in the world who are trying to make excellent quality, get the same grade as someone who's getting by by the skin of their teeth. And there are so many tricks that can be played that are not detected.

For example, you can take an oil that fails the chemistry test and say there's ... let's take one protocol of the chemistry test. It's called "FFA." The IOC and the NAOOA say that .8 FFA is the maximum amount of FFA that you can have in olive oil and call it extra virgin. FFA is kind of a freshness quotient, is the simple way to put it.

So you produce some olive oil and the stuff sat on the ground for a while and you picked it late and you come in with 1.2. You fail the test. But you crushed some in November and you got a .3 or a .2 FFA. You mix them together and suddenly the oil that didn't pass passes the chemistry test. However, that oil that had a 1.2 that really didn't pass the chemistry test—that defect will show up if you have a really trained taster to find it.

So this problem—I'm not saying there isn't a solution. There is a solution, and I'm confident it can be worked out if there's the willingness to really look at it. And I think it can be done so it's not exorbitantly expensive and where it punishes. And

there's several ideas. One is that you could have quantities—up to a certain quantity you test, so the small farmers aren't unduly penalized by this thing. Another way is to have all imported oils tested and have the importer pay for it—part of the cost. It must be tested as they come in. Policing agencies, like the COOC.

You know, if you take and you compare the olive oil industry to the wine industry, the shenanigans that go on in the olive oil industry would not be tolerated in the wine industry because there's this huge industry pressure—competitive pressure. They rat on each other. They check each other out, and they do it on a regular basis. And that's a good thing. But we don't have that internationally; that kind of esprit de corps that you really need.

And again, the last thing I want to do is paint this picture like it's them against us. It's not that way. The best producers in the world: Boundary Bend—which, for my money, has done more to change the culture and the economics of olive oil than any other company in the world—almost went broke last year. They're not just producing great olive oil; they're the most efficient company in the world, and they almost went broke because they cannot compete against the subsidy.

So there's a lot of problems, and there's a lot of issues, and they really need to be handled one by one, and they need to be studied. You've got a great group here. You've got a great group of people internationally who'd also contribute, and I recommend that we begin to look into this thing and dig deeper.

SENATOR WOLK: Okay. Yes, go ahead.

SENATOR LA MALFA: I appreciate that. We can't fix everything, especially with international trade. But at least we can start to make some really good headway on what we know is in that bottle or in that can there and help you with the tools to do it. But it's really got to be industry-driven and explained well to us. This body here is not going to do this that many times, so you really probably want to try and hit it the first time or at least 90 percent. Then we refine—sorry about that word—the legislation as we go along in little bits. But you really want to hit this right out of the chute. You know, we're here to help, and I appreciate your candor on this, but it is very important. It's a beautiful product, and it would be something that we could do so much more of in this state.

As was mentioned earlier, 1 to 2 percent of what is used in the U.S. has come from the California ... the recent influx? There's so much potential out there,

especially for a quality product; that once the consumers try it, they love it. When I give people our medium-grain rice from California—they're used to that other stuff from somewhere else—they love it! So I get that.

One last shot. Madonna keeps running through my mind here. Have you contacted her about being your national promo in this thing? (Laughter) You could just go through the roof there.

Anyway, thank you.

SENATOR WOLK: Senator Berryhill.

SENATOR BERRYHILL: Yeah, thank you. You know, as I sit here and as I've listened to everything, I sit here and I'm very frustrated because, you know, we want to help you. But as I listen to some of your problems, obviously you have some federal problems in this thing too. One of my questions is: Have you talked to Karen Ross, our director of Agriculture—secretary of Agriculture—here in California? Obviously, we're going to have to do something federally in this thing. If we can do something in California to start this thing on its way—I mean, we're at the infancy of a beautiful industry that's going to bring a lot of jobs, a lot of tax revenues into this state. Very exciting! But we've got to keep you healthy.

I think like Doug said—we are here to help you. We want to do something, and we'd like to do something maybe even this year, to start this process going. But obviously, you're going to have to use as many tools as you can to go back federally, too, and take care of a problem that, obviously, is out of control and that we're going to have to handle at the border as it comes in.

So anything that we can do, let us know. Thank you for coming. It's been a very interesting panel.

SENATOR WOLK: It's been a terrific panel. I want to thank all five of you for your contributions. Stay tuned. We're not finished yet, as you heard from my colleagues. But thank you very much.

And let's move on to our next panel. We have the world view now. Mr. Bauer and Mr. Miller, welcome.

Bob Bauer has been the president of the North American Olive Oil Association since 2002, and it's headquartered in New Jersey—in Neptune, New Jersey. Their membership is comprised of U.S. and Canadian companies who market olive oil in North America and foreign companies supplying olive oil to the North American

market. It's part of the Association of Food Industries, an association of nearly 1,000 companies worldwide that foster the international trade of food products.

Before joining the NAOOA, Mr. Bauer was a journalist, beginning in newspapers, and then went to trade publications in the transportation field and then to the food industry. He also worked as the editor of a grocery section of the *Supermarket News*, which is the leading trade publication in the supermarket field.

He attended Temple University (that's in my hometown) for two years and completed his college education and received his bachelor's degree from Glassboro State, now known as Rowan University.

Welcome, Mr. Bauer.

MR. BOB BAUER: Thank you for the opportunity to speak this afternoon.

Established in 1989, the NAOOA is a trade association of marketers, packagers, and importers of olive oil in the U.S., Canada, and suppliers abroad. The association strives to foster a better understanding of olive oil in its taste, versatility, and health benefits. We applaud Senator Wolk for including us as a voice in the importer community here at this meeting and look forward to ongoing participation in the subcommittee's activities. You'll quickly see how similar our goals are to those who have already spoken today.

At the heart of the NAOOA's formation was the creation of a quality assurance program. NAOOA members—again, importers of high-quality olive oil—recognized that North American government authorities were not allocating resources to prevent suspected economic fraud, as there was no perceived public health risk. The NAOOA pioneered quality control testing of olive oil in the U.S. It has been conducting the most far-reaching quality control program now for more than twenty years.

It should also be noted that a condition of NAOOA membership, is that the random samples of members' oils collected from retail shelves throughout the year and must meet the recognized international standard set forth by the International Olive Council. Failure to do so is grounds for expulsion from the organization.

Over the past twenty years, the NAOOA, in conjunction with the United Nations' chartered International Olive Council—the worldwide body that sets standards for the olive oil industry—has tested thousands of samples of olive oil. The existence of the NAOOA's testing program has greatly deterred those who might have otherwise been tempted to market substandard product in the U.S. In spite of the allegations made

here by others today, consumers can be confident they are buying quality product. Nearly 99 percent of the sales volume represented by the oil sample over those twenty years has met the international standard for olive oil. As a result of its testing program, the NAOOA has taken action in respect to those packers, foreign and domestic, who have not complied with the international standard by alerting federal and state officials.

And our successes have not been limited just to our testing. For example, last year while buying olive oil samples at a regional grocery chain in Southern California, I came across a bottle labeled “Blended Extra Virgin Olive Oil.” On the back, the label said the product was a blend of extra virgin olive oil and vegetable oils (similar to the example that Mr. Bradley gave). We contacted the owner. In fact, I did it right from the store, and they actually had the gall to tell me that the FDA had approved that label—we’ll get into that a little bit later. We contacted them and the retailer, but neither was willing to do anything about removing the product. But we were unhappy.

We notified several government agencies, federal and state agencies, and we were happy. We received word just earlier this month from the California Department of Public Health, that the agency forced the brand owner to correct the problems. And we’ll be certain to follow up by visiting that chain again very shortly to ensure that the mislabeled product is not still being sold.

I also received a call earlier this week from an inspector in the FDA’s Office of Criminal Investigations about a likely action against a company we notified FDA about. These are ... particularly the second item, where FDA is acting, is something that makes us happy. We were the ones who provided the information to FDA regarding the health benefits—the petition for the health claimants allowed on the products. We’ve been asking for years for them to pick up their enforcement to defend the claim that they were allowing people to make. So we’re happy to see that.

The NAOOA continues to seek a level playing field and is pleased the four states—California, Connecticut, Oregon, and New York—have responded to industry requests to create a standard of identity for olive oil sold within their boundaries. In fact, I remember speaking with domestic producers while we had things underway in Connecticut, and we decided to work together here in California. I testified at a hearing at this very building in support of a state standard for olive oil sold to California.

The NAOOA also supported the update of the voluntary USDA grade standards for olive oil; even though the petition filed by the California producers was less stringent than the international standard, but the domestic industry said it could not meet the international standard, as noted earlier. The NAOOA members, as I mentioned before, are required to meet that tougher standard.

The NAOOA randomly samples more than 200 olive oils every year, without bias with respect to producer size, country of origin, or economic interest. The sampling is spread throughout all channels of trade: retail, food service, and the industrial/ingredient use. We've heard statistics today about high levels of economic adulteration in the category. The premise of a widespread problem is not correct. _____ over our twenty-plus years of testing proves this. The market share of the oils that do not meet the standard typically is 1 to 2 percent of the olive oils available for purchase.

Having said that, any economic adulteration is unacceptable, but while we're all anxious to put a stop to the problem, we can't allow ourselves to act in a hasty manner by relying on tests that have been rejected by the world's experts on olive oil. The PPP and DAG tests touted today were in fact rejected by the International Olive Council and its expert panel of chemists. If these tests had been approved, those seeking to use them should go through internationally recognized channels through the organization of experts that represents 98 percent of the world's olive oil production.

The NAOOA is a signatory to the IOC's quality control monitor agreement. At the last signatory's meeting in October, the IOC executive director said the organization was reviewing these test methods again. When I was given the floor, I began my comments by commending the IOC for conducting such a review. I said it there and I'll say it again here: if one or both of these tests in question are adopted by the IOC, the NAOOA will fully support their use.

Organoleptic panel test—taste test, if you will—have also been cited today. While these tests can be useful, we don't think it's wise to base classifications of such economic value on tests that contain any level of subjectivity. Panel tests, whether conducted in California, Georgia, Spain, or anywhere else, are subject to bias. Much of that bias is unintentional, but some of it's clearly nationalistic.

Another topic discussed today is the possible petition for a marketing order for olive oil. An olive oil marketing order would increase the cost and thereby reduce the affordability of a very healthy product—domestic or imported—to U.S. consumers. This could be detrimental to the public health policy that encourages you as consumers to eat healthy.

The rationale for the marketing order is based on the recent findings cited by UC Davis, but there's no scientific basis to support UC Davis's claims for the need for increased quality. The message is based on methods that don't rise to the level of proper study. It was pointed out, following the release of both studies, the UC Davis reports are based on statistically insignificant sampling and on a rejected laboratory test and subjective taste testing methods.

The mission of the Olive Center at UC Davis is to grow the California olive oil industry. Only one result would have made UC Davis and the producers who funded the studies happy. Using those rejected chemical tests and subjective taste test helped them attain their desired results. We, on the other hand, don't have such an agenda. If the test results that we conduct show an oil meets the international standard, that's good. If it doesn't, it allows us to take steps to try to address the problem and clean up the industry.

Our twenty-plus years of testing have shown some mislabeling and adulteration but at a level of 1 to 2 percent of market share, not at a level that we require testing of every domestic imported production line. My understanding with other market orders I've seen is that marketing orders require the testing of every lot that's produced, so marketing order is an expensive and excessive response. A research and promotion order, on the other hand, would raise substantially more money that could be used to educate consumers about this wonderful product.

As I noted earlier, there are a lot of areas of agreement with everyone in this room. At last week's marketing order event, it was suggested that an FDA standard of identity for olive oil could still be helpful in combating the olive oil quality issues. The NAOOA has felt that way for quite some time. In fact, we petitioned FDA in the early 1990s to adopt the international standard as the U.S. standard of identity for olive oil. Since an FDA standard is mandatory, we were surprised when the California Olive Oil Council declined to work with us to encourage FDA to act on our petition and instead filed a petition with USDA regarding the voluntary USDA grade standard. An FDA

standard of identity for olive oil that matches the international trade standard, against which 98 percent of the world's olive oil is reduced and traded upon, would put the U.S. on a level playing field with the rest of the world and greatly enhance the opportunity for government and private action against companies that don't meet that standard.

As you know, there's a standard of identity for olive oil sold in California. There's also agreement among all of today's speakers that even the very basic testing—the basic IOC procedures—could easily detect some of the low-hanging fruit, so to speak—product marketed by companies known to mislabel bottles and tins as extra virgin olive oil, even though they've added less expensive oils to the product. We've notified FDA about such companies. We've noticed states agencies about ... notified state agencies about such companies.

Senator Wolk and members of the subcommittee, there's a chance to make an immediate impact by putting pressure on the appropriate state agencies to take action against such companies with the laws that already exist today while still looking to the future to improve and determine other ways to encourage a greater level of quality. These are instances of blatant misbranding and should be very easy to prosecute, because again, the testing is very cut and dry and it's very easy to detect, and there's really no defense for it. Only one or two successes along these lines is all that's needed to send a strong message that will reverberate throughout California and perhaps throughout the country. It would also create a model for other states to follow; something that would help California producers compete in other states.

Importers and imported olive oil have unfairly been cast in a bad light in recent times. As you've heard today, it's these same importers who've helped create and have funded the industry's most complete quality control program and there's a disconnect there. These importers and the NAOOA stand ready to continue their efforts and to support any quality control efforts based on universally agreed upon sound science.

We thank you again for the opportunity to participate today and look forward to future opportunities to participate in the workings of the subcommittee.

Thank you.

SENATOR WOLK: Thank you, Mr. Bauer. After the last panel, you certainly do present challenging testimony, which I want to delve into. But I would like to first

allow Paul Miller to go forward. And then, we'll return with some questions and concerns that the panel may have—the subcommittee may have.

Mr. Miller, welcome. I know that you have been the president of the Australian Olive Association, Ltd.—the olive industry body in Australia—since 2001. He chairs the committee that developed and oversees the new Australian Standard for Olive Oils and Olive Pomace Oils. He also led the Australian Olive Industry Code of Practice with its Certified Australian Extra Virgin branding.

He's an agricultural scientist with a lifetime in farming and research. He's the director of several businesses in the wine industry; grows wine-grapes, chestnuts; and advises olive companies in Australia and the U.S. And he has also recently established a specialist food-oil technology company: Oilmiller, Ltd.

Welcome.

MR. PAUL MILLER: Thank you very much, Senator Wolk and committee. It's a great pleasure for me to be here. For a long time, I guess probably the last six years, the Australian industry has been cooperating very closely with counterparts around the world, none more so than the California olive industry. And it gives me great pleasure to be here and to see your interest in this particularly important subject.

In my time as president of the Australian Olive Association, I've also become involved in committees around the world that included helping found a committee in Europe for Euro Fed Lipids, which is the technical and industrial body that represents those industries in Europe; and more recently founding an expert committee on olive oil for the American Oil Chemists' Society, which is a global body that is very important in this whole equation.

Certainly, in Australia our experience has been very similar to the U.S.A. in terms of the state of the market there. It is the case that greater than 50 percent of what is sold on the Australian market does not make the grade, certainly in the retail sector and in the food service sector it tends to be worse than that, although it fluctuates a little. That greater than 50 percent in the Australian market is generally made up from government-sponsored testing in Australia of around about 70 percent of the imported product, and around about 20 percent of the domestically produced product not making the grade. And by not making the grade, I mean, in particular, not making the grade for extra virgin.

Certainly, our view is increasingly that there is extra virgin and the rest. And I refer back to Dan Flynn's talk earlier when he said you can envisage a line above which is extra virgin and below which is lower grade product. In the consumer sector in Australia, and I believe in the U.S., that's pretty much the way it goes. People who know about olive oil would differentiate in that way.

We've certainly tried working with the International Olive Council for a number of years, and the Australian government has also been down that path. We've come up against resistance to what we've been trying to do in forums like Codex Alimentarius in the U.K. and subsequently in Malaysia where their Fats and Oils Committee meets. I'm pleased to say that the California Olive Oil Council, along with the U.S. government, has been working with us at Codex Alimentarius on these matters very much alongside and with the same view that we have.

After many years of attempting to, I guess, run with what is essentially a European standard—although it's called an International Olive Council standard—has identified numerous deficiencies in that. In fact, we came across these deficiencies using science that was developed in Europe. If you try to sell oil, as I have done, into northern Europe and in particular into Germany and Austria—as early as 2006 when we sent oils there—the standards and the technology that's in the Australian standard, which is not in the International Olive Council standard, applied. The retail sector there has woken up in Germany, and generally you get very good olive oil—in particular, extra virgin olive oil—in those countries. So I'm referring to major companies like Aldi and Lidl who are huge retailers. The German government has seen fit to apply the technology that we have applied now in the Australian standard.

In developing the Australian standard, it was a process of consensus. It was a government-sponsored initiative which included everyone in the supply chain—government, scientists, and importantly, consumer groups. And I would encourage you to involve those people because they have, obviously, the major vested interest in this. So the Australian standard was really a consumer-oriented standard developed to try and simplify and provide a solution to this problem. And I'm confident that it sets a good base from which the U.S. can work, and we're only too happy to help in any way we can as the U.S. industry seeks to pursue—and, in fact, the U.S. government seeks to pursue—hopefully a better situation.

In Australia in particular, we found a lot of product being sold as extra virgin that had been refined; and so, a major part of the technology in our standard was focused on detecting that, which comes directly from the German experience. Now, having said that, I'm also pleased to say that this technology, which I know the International Olive Council has criticized, is ISO accredited and AOC is accredited. So the major fats and oils body in the world—in fact technically, the American Oil Chemists' Society—is happy with our technology, as is the International Standards Organization.

In our experience with the International Olive Council, Australia actually considered joining, and then leading up to 2005, the rules were changed. The International Olive Council, as the U.N. body, used to work on consensus, so all members got a vote, and membership was paid on the basis of a formula which was about how much you consumed as well as how much you produced. In 2005, that was changed to be purely how much you produced, and voting was changed to be on that basis; so no more consensus.

In my view, that was done to protect a structural defect in this global industry, and that structural defect is really driven by institutionalized subsidization of the European industry that has left lagging behind new industries in the olive sector, like those in Australia and the U.S. Those industries in Europe cannot make more than about 30 ... at the most, 30 percent extra virgin grade. The way the industries are run, most olives are swept up off the ground, so that oil has to be refined, and that's fine. The world, however, is demanding extra virgin.

So there is this natural tension that has evolved between the engine of production currently based around the Mediterranean and the markets—in particular, new markets like Australia, the U.S.A., China, and so on—that are demanding a higher grade product. So there we have it.

In Australia, we have a standard, and what does that mean? Well, what it means actually, initially, is that we have a document, a piece of paper, and that doesn't mean anything unless something happens with it, as you well know, and has been the experience here in Australia. Over, I guess, the ten-year period when this was being pursued in Australia increasingly by government, there has been some government action.

We have a system in Australia where we have a Trade Practices Act, or trade practices legislation, and the basic principle under that legislation is that what is on the label should be in the bottle, as a consumer would reasonably expect it to be so. The Australia Competition and Consumer Commission polices that piece of legislation and takes legal action when necessary, subject to their resources. In 2008, they conducted some studies following a government-sponsored survey that showed widespread problems in our marketplace and actually took some action. And then they asked us to develop a standard along with the Department of Agriculture, which we did. Since that standard came into place earlier this year, our Consumer Commission has, with industry funding, had some surveillance happening on a quarterly basis—random sampling of the retail sector—and I know it's about to take some action.

But a bigger problem for us is the food service sector, and I think that's a major problem everywhere. It was alluded to today. And I'm pleased to say that Australian Customs is starting to look at ... having a look at doing some policing on the border using this standard. So it's kind of a global problem, and there are some global things happening. You would do well, also, to look north to the Canadian Food Inspection Service that has been monitoring olive oil for a long time and finds a range of issues and does take action and does fine and does publicize the names of those who do it.

Of course, alongside all this science and technology and development of standards, there is also the PR and political aspect of this problem. In Australia, we had strong resistance from our major retailers to this whole process, and they acknowledged it was because they didn't want to change and they didn't want the cost of changing. And one of the things they didn't want to change was the selling of oil labeled "pure," "light," and "extra light." This standard specifically prohibits that, because our consumer research along the way indicated that consumers think extra light is low-fat olive oil when, in fact, the reverse is quite true. I'm pleased to say that in the last few months both major retailers have agreed that their home brand, or their private label product, will comply, and I know they are testing.

And that brings me to my final point. It's all very well to say ... and I work with the importers in Australia too. They have sampled stuff and sent it off to Europe to be verified and had the oil come back with a big tick—stuff that they know should not get a tick. It comes down to, in fact, somebody in government in Australia or the U.S.A. or

in Canada or in Germany taking the bit between the teeth, funding some good research, trusting their own science. And you have the American Oil Chemists' Society here—the most respected fats and oils body in the world, in my view. I wish we had them in Australia. Trust in your own science, trust in your own scientists in cleaning up the marketplace.

You don't have to test everything. When government acts, it's in the fortunate position that it can publicize what it's doing. That is the principle on which the Australian Competition and Consumer Commission acts: it makes its findings public. That makes everyone in the trade nervous and they start to lift their game. That's what needs to happen here. You have to get out there, do some surveillance—do some prosecution. Make it known that on a random basis, periodically stuff is going to be taken off the shelf, both domestic and imported; stuff is going to be checked at the border, the food service; and that will change the market in the U.S.A., and dare I say it, change the world view of this market.

Thank you.

SENATOR WOLK: Excellent. Thank you, Mr. Miller. I have a number of questions—but Senator? All right.

I want to go back to Mr. Bauer. I have a number of questions to ask you. I was curious of your criticism of a federal marketing order. Does that mean that you would not be willing to adhere to such standards or require your importers to adhere to such standards if there were a marketing order issued?

MR. BAUER: Not at all, because our members already have to adhere to those standards. The bigger issue with a marketing order is that every lot gets inspected. You're not talking about a small product and volume. That would be the same for domestic producers. Again, this is my understanding based on what I've seen in other marketing orders. So you're adding a significant cost and delays in the system, and as was mentioned today, olive oil doesn't get any better when there's delays. And I've heard delays of at least a month regarding inspection and communication between USDA and FDA regarding releasing product that was inspected. So a marketing order would facilitate those types of delays, which is something that would be bad for the entire category.

SENATOR WOLK: Mr. Miller, do you have a comment on that, as to delays? I should probably ask Adam about that. Adam, do you want to come back to talk about

marketing orders for a moment? What is the issue of delay? Is that, in your view, a serious issue?

MR. ENGLEHARDT: In terms of the implementation of an order?

SENATOR WOLK: Mm-hm.

MR. ENGLEHARDT: As I understand the process—again, there are attorneys that we've engaged to guide us through this, based on a lot of experience with other orders (Rice Commission board)—a draft must be prepared based on a consensus of California growers. It is then submitted to the USDA for approval. Following approval of the USDA on the language of the order and its compliance with precedent and the marketing order legislation, the order is then put to a vote of the growers and requires a two-thirds majority of growers by number or a two-thirds of growers by volume, at which point, if the order was passed, it would become federal law. So the delay is primarily in the USDA's adoption of, and approval of, the order. Bringing it to a vote, I think given the support we have from other organizations within the state and the existence of most of these lists and grower databases, bringing a draft together I think will be a fairly speedy process. I think the delay will be mainly in the USDA and how long they drag their feet to approve the draft. The greater challenge will be to then apply for the AE order, which would then apply those standards to the imported products. Well, that is a process that I'm not as familiar with.

I think in the interim it would be very effective to have closer scrutiny put on the California standard for product that is traded in California through local prosecution at the state level and district—because that is a law in California—as well as have the USDA look further into enforcement of the existing grade standards nationally prior to the completion of a new marketing order and standard that is created.

SENATOR WOLK: Thank you.

Mr. Bauer, you talked about having notified state agencies and having gotten no response. Could you tell us a bit more about that?

MR. BAUER: Yes. I'll _____ about California what we've done in other states as well. Once the standard was in place, anytime we found an oil that was ... we refer to it as "grossly adulterated" so there can be no doubt what it was. It's not something that just misses the standard, because that's hard to ... there could be

some disagreement as to whether or not that's easy enough to take action against. But this is somebody putting something else in there.

SENATOR WOLK: But this was not California.

MR. BAUER: It was in California.

SENATOR WOLK: It was California. I would like more information about that.

MR. BAUER: Yeah, and I can provide you with copies of letters that we've sent to the agency. There were at least two companies in California who, over the years, we had notified the state attorney general about several times. In addition to FDA, we notified the FDA on the national level and the district level where we bought the product and a few offices within FDA. But since California has a law in place now, it could take action—well, any state, it seems to me, could take action much easier and much more efficiently than the federal government can just because of size.

So we really think ... and speaking with Tom Mueller awhile back—and he mentioned today, if you get one or two hits on something like that that is so easy to prove, that message just goes nationwide because people are going to realize. And people can't pick and choose where they're sending their product, which is why we are contacting other states, too, trying to get more and more states to adopt standards of identity for olive oil because then it gets hard, you know, looking to ship here and there.

But initially—and I'm sure any speaker that already spoke today would probably agree—it's the low-hanging fruit that's out there. Everybody knows who they are, and we've all probably told the state who they are. If we can get some action on that, boy, that could go a long way.

MR. ENGLEHARDT: I'm a bit curious as to clarification of point. If I heard you correctly earlier, it was in defense of the NAOOA's testing regimen has ensured that 99 percent of the oil does in fact meet the existing standard. If I hear you correctly, and your last sentence was that you are only pursuing action on the most egregious offenders. That seems to me like a little bit of a conflict there in the statement.

MR. BAUER: No, it's not true. My point was that the easiest action to take, the swiftest action, the least costly action for a state or a federal government to take would be against the ones where it's so blatant and so easy to prove out there.

MR. ENGLEHARDT: So to paraphrase that, the position of the NAOOA is only to take action on the most egregious?

MR. BAUER: Absolutely not. Absolutely not. We notify the government of every issue ...

MR. ENGLEHARDT: Every issue. That's in conflict what you mentioned earlier. So every issue?

MR. BAUER: It's not in conflict.

MR. ENGLEHARDT: Every issue or just the most egregious ones?

MR. BAUER: Particularly the most egregious ones. If something is very close to standard, the government is not going to take action against it. The cost to try to defend any action the government would take—they're not going to want to take action against them. Yet, we still notify them when there's an issue. When there's a blatant adulteration that takes place, we aggressively go after as many government agencies as possible. We try to sit down with them—particularly on a state level we've done that—and try to get them to take action against these companies.

SENATOR WOLK: Mr. Bauer, do you have a website that publicizes all of these enforcement actions that you're initiating?

MR. BAUER: No, we don't do it publicly. We go through the government agencies because we believe it's their responsibility to take action against them.

SENATOR WOLK: I will agree with Mr. Englehardt. The sum and substance of your testimony was that most things were fine.

SENATOR BERRYHILL: Just a quick question.

SENATOR WOLK: All right. Go ahead.

SENATOR BERRYHILL: There was a group ... the group that was here before made the statement that they felt that almost 75 percent of this stuff was under-quality. Are you refuting that, that number?

MR. BAUER: Yes. Yes, because that was based on these two tests that were not unaccepted; they were rejected by the international organization of the world's olive oil experts. So they were rejected as being unreliable, Senator, based on, primarily, on those two rejected tests and a taste test, which no matter how you break it down—and we've done our own ... sent samples out to places and have them do taste analysis, and the panels come back with different replies because there's a degree of subjectivity whenever you do a taste test.

SENATOR WOLK: Could we have Mr. Miller address the substance ... some substance of the test issue?

MR. MILLER: Starting with the chemistry, and in particular two tests that the International Olive Council has rejected—although, I know they are certainly still in discussion about those at the panel of expert chemists. I come back to what I said: the American Oil Chemists' Society and the International Standards Organization are fine with those tests. They're very effective at detecting low grade oils and very effective at detecting soft-refined oils blended in with extra virgin, which is where a lot of the problem lies.

In Australia, it was government that examined that issue; government that examined those data, those data points. It was the Department of Agriculture, Fisheries and Forestry chemists who examined all that methodology and looked at all that data point and was quite satisfied that that was fine to work. And I'll come back to what I said before on that and go a little further.

In Germany, when that started to be applied by the government—and in my view, the Germans have the best fats and oils chemists in the world—initially it caused a fair bit of activity and publicity and controversy in the marketplace. But ultimately, the major retailers saw fit to say, "We're going to apply this as our internal standard," and they used this chemistry three or four times a year to monitor the progress of extra virgin olive oils in that marketplace and in neighboring countries. So it's not good enough to say these have been rejected by the International Olive Council when you have also American Oil Chemists' Society and major retailers adopting this in Germany and now in Australia.

So it has been, in my view, rigorously examined and is certainly subject to discussion at the IOC. And you would do well to ask the American Oil Chemists' Society about this too.

Getting to the tasting of olive oil, certainly it is to some degree subjective, *but* it is a scientific process. There are statistics involved, and sensory analysis is something that is conducted by whole departments at universities across this country of all types of foods. So I reject any thought that it doesn't have significant value. Certainly, you can get to marginal points of difference about obvious things like rancidity and significant rancidity. The vast majority of test panels will get that. The good news is that this advanced chemistry follows along quite nicely beside the taste test, so a combination of the taste test, these particular tests altogether, in fact can describe the life of olive oil well before it fails a test. The methodology actually is becoming really,

really good. And I'm hopeful that one day soon the retail sector in particular will take this up as a way of monitoring what's on its shelves. That is the ultimate outcome. On behalf of its consumers, it feels obliged to do that, and that has certainly been the experience in northern Europe and, in fact, in the U.K. increasingly.

SENATOR WOLK: My colleagues—do you have some questions?

SENATOR BERRYHILL: I'm going to have to leave, Madam Chairman, but I would like to make a comment on marketing orders. Mr. Bauer, you don't think it's needed, marketing orders in the olive industry?

MR. BAUER: As we said(?), I think it's excessive. I think there are better ways to handle that as opposed to adding those _____.

SENATOR BERRYHILL: You know, marketing orders are always controversial. We've got them in the grape industry. You know, we've got them in the almond industry. The federal marketing order in the almond industry, as controversial as it was, has been a tremendous asset to that industry, and it has boomed globally because of it. So I think this is probably where we're heading. It's probably going to be a good thing for this industry, you know, to come together and come together within themselves and to do something to move this olive industry forward in the future.

As I've got to go, I just wish you the best. Thanks, everybody, for coming. And I appreciate everybody's input.

SENATOR WOLK: Thank you, Senator, for being here.

Senator La Malfa? Did you wish to ...?

SENATOR LA MALFA: I'll follow on that point too. I think, Mr. Bauer, you mentioned in your opinion on the marketing orders that because they would require extensive testing, like every lot—was that the main beef you had with the concept? Is that a process that could be altered a little bit so it ... again, I think we're trying to find a float level here of what is comfortable for the growers on the amount of testing or the cost of that; that sort of thing. We want everybody to be comfortable with it because we want the thing to work. So why couldn't we find ... just because it says "marketing order" it doesn't mean test every vat, test every lot. Is that correct?

MR. BAUER: It's my understanding that the marketing order law requires every lot to be tested. And another problem ...

SENATOR LA MALFA: We could define "lot" different ways then.

MR. BAUER: Well, you could, but basically, I know on the import side it's at least every import shipment. Now, the importer could choose to divide that shipment into various lots. I've seen that done on some other products because if one aspect is held up, you're not holding up the entire container or something like that.

Another big issue there is, again, we don't accept these new tests yet. They show a lot of promise. And Paul Miller knows a lot more about the chemistry than I do. He's an expert in this area. I just need the rest of the world's experts to agree with him, and so far they have. Now, they're looking at it again, and we've asked them ... we've commended them for doing that. We had asked them prior to when they started doing it to look at these tests, and they are. We did the same thing with the panel testing. That is not part of the IOC's ongoing testing when it does this program. We asked that it be included, and right now it's in a pilot phase where it is being included. Because again, as I mentioned, to make an economic judgment on something that has a degree of subjectivity could be problematic, and going forward with a marketing order or any other type of requirement here in the United States, we were told in some states that, "Absolutely, we won't even consider putting anything in place that has that in there because it's going to cost us more money to try to defend that action than we're going to get in return for it and the benefit for it."

So our issues are, yes, as far as our understanding, it has to be every lot, and we don't agree yet with the test.

SENATOR LA MALFA: I guess that would be something we'd have to explore if the idea of a marketing order is something that's very important to make all this work. And certainly with your input, and getting everybody at the table, testing subjectivity/taste subjectivity is maybe a bit of an art, but if that's applicable to the wine industry as well and they have a good workable solution, maybe we can emulate a lot of what wine does, and some others, to reach that. You don't want to be too subjective, but you want to be able to take some of the art aspects of this and have it in there if you can get a pretty good consensus. Does that seem agreeable?

MR. BAUER: It does. And as Mr. Miller mentioned, the new tests, if they do get recognized by the IOC and correlate with what the taste panels find. And the IOC also has a fairly new test to detect some of the issues that these tests also do. So some sort of combination, yeah, it could very well work.

MR. MILLER: Can I just make another point about the chemistry that may clarify this for you?

SENATOR WOLK: Yes, of course.

MR. MILLER: And I'll reiterate—I probably don't need to—that these are ISO and AOC has accepted. But anyway, put that to one side.

The fact is that when an oil is freshly made and it's in really tip-top condition—to give you an example: one of the tests, it starts off with a level of 95 out of 100. After two years, in Australia it's still over the minimum accepted standard—a good oil. So we're not talking about much of a bar here in terms of making the grade. And that would encompass all extra virgin. So it actually describes—if you want to—the life of the oil and at the end of that time. By the time it fails that test, even marginally; it's pretty tired, gone oil. So it's not like we're saying, you know, everything has to be exactly this and a slight variation is a problem. There is a lot of scope within what's being proposed for the marketing order and what now is being adopted in Australia for good oil over about a two-year period.

Now, personally, as a producer, I want my oil consumed within two years, I've got to tell you. Because if it doesn't I've got a problem: I haven't sold it yet; it hasn't been sold in the end. So it's not like this is overly restrictive. This stuff is being used in retail, and it is on that basis that oil starts really good and has a life. And so, we're setting quite, I think, a conservative and reasonable kind of bar in terms of a minimum acceptable quality, and that's what we're talking about here.

SENATOR LA MALFA: May I ask if Mr. Englehardt has a

SENATOR WOLK: Yes, Senator.

SENATOR LA MALFA: Do you have a thought on that too?

MR. ENGLEHARDT: Yes. I think much of Mr. Bauer's response; I think his logic path is not quite correct, in that he is confusing the methodology of implementation with the necessity for changing the problem. One of the nice aspects of marketing orders is they are drafted by the body that is proposing the marketing order. That would then require USDA approval, but there is much flexibility in terms of how that order is to be implemented at a final level. So I think it's important to not totally forego the marketing order itself, based on his assumption of how that methodology is going to be used.

In terms of the standard being enforced, it's not defined, and I would refute that Mr. Bauer's understanding of that process. He is using the logic that it will be too arduous to sample every lot, at the same time using that same logic that that method is too arduous to refute the whole marketing order concept. I think it's important to step back and look at the end goal, which is to cause the enforcement of a standard, and one would hope a standard that is updated to reflect some of the modern science. And a marketing order is just one of *the* possible methods to reach that point. And as I stated earlier, my opinion is that it is the best option that we have, and is legislation that is unique to United States growers of other places in the world.

And I think the precedent is there; that the U.S. has adopted standards different from other areas of the world that were once production centers for other crops. The pistachio standard comes to mind. The almond standard. The grades of trade using almonds are different than the grades of trade that were once used in Spain, which as recently as fifteen years ago was the lead production in the world, which we have quite neatly surpassed here in recent years. Wine grape standards and certifications for grades of trade in the U.S. are much different than those that are used in the E.U.

So there's a lot of precedent for an emerging industry in America to essentially refine and redefine the standards by which we hold ourselves. I think, again, the actual exact methodology by which that's carried out can be worked on.

SENATOR WOLK: And I think that's a very good close to our hearing and to this panel. I want to thank all of you—both of you—for coming today.

I want to just close by, first of all, thanking everyone, of course, but I want to tell you that the Olive Oil Subcommittee is looking at how we proceed with respect to policy, whether ... well, how we proceed, supporting federal efforts, but also what we can do here in this state with respect to supporting and advancing good olive oil production, authenticity issues, quality issues, enforcement—of course, we've heard a lot about that today—the marketing order, the need to educate the consumer. We need to do that.

We have a ... our committee, our subcommittee, has a very fine advisory committee, and many of the panelists belong to it, but there are some others who are here as well, that I want to acknowledge: Alexandra Davarenne; Lillian Dickson is also here; Deborah Rogers and other members; Dan Flynn, of course; Jim Etters, Brendon

Flynn, Brady Whitlow, Darrell Corti, and Mike Bradley have agreed to serve, and we will be working with them, as well as consumers, producers, retailers, to figure out what the next steps are.

We have now public comment. This is a public hearing, so it's the time when I will excuse the panelists. Anyone in the audience who is so moved to address the subcommittee and has anything to say, I would appreciate it.

I'm going to put somebody on the spot—Mr. Corti. I know I didn't ask you to speak—I know you're in the audience—but I thought you might, if so moved, want to speak to the issue of sensory testing that was raised. I think you're uniquely qualified, I believe, in the audience to talk about the value of such—or the reliability of such testing. And I'm glad you're willing to come forward.

Welcome.

And anyone else. Public comment is the time anyone is willing to ... who would like to mention anything—come forward—is welcome to do so.

Welcome.

MR. DARRELL CORTI: Thank you very much. I really don't like talking without a script. However, I found some of the comments today very interesting about tasting, only because of the fact that in the International Olive Oil Council's description of what extra virgin olive oil is, it has to be without a defect. The only way we can determine if an oil has a defect or not is by tasting it, because so far, we have very limited use of a tasting machine. And that's why the International Olive Oil Council is also the people who guarantee the technical ability of a taste panel. Because they're the ones who set the rules, they're the ones who do the testing, and if the panel doesn't match the test, well, the panel is disqualified.

So this is a very important part of oil production, because the oil science part, as we've seen today and most of the testimony, you can actually change some of the chemistry very easily. What you can't do is change the way it tastes.

Since I'm the chairman of the Los Angeles competition, I tend to hire as tasters, tasters that are the major tasters in their respective countries. So we have Spanish experts, Italian experts, Australian experts, New Zealand experts. Because originally, my idea was to actually get them to taste California oil so that we would improve the breed. Well, what that's done is it's actually given us the opportunity to see different kinds of tasting. And this year, the Los Angeles competition is divided into two

hemispheres: Northern Hemisphere and Southern Hemisphere. People from the Southern Hemisphere will taste oil from the Northern Hemisphere and vice versa.

But the quality of the taster is what's very important because you have to have a taster who's competent. A machine cannot do it yet. Once they become practiced at doing this, they may in fact invent a machine that can tell you right away whether an oil is rancid. You then would eliminate tasting the oil, because if the machine says it's rancid, it's rancid; why taste it? It saves a lot of bad tastes in your mouth when you taste oil. (Laughter)

SENATOR WOLK: I was going to ask you how likely it is to find a machine that's going to be able to do that.

MR. CORTI: They already have the prototype for it. But it does only rancidity, since that's the major problem. There are other analogous problems that you can discover by tasting, but these machines cost money. Doing the tests cost money. Unless there's a monetary resolution to the whole thing, no one likes to spend the money uselessly.

SENATOR WOLK: I want to thank you for letting me put you on the spot. I appreciate that.

Public testimony, come forward. Please identify yourself and have a seat at the mike.

MR. DENNIS BURRESON: Yes, my name is Dennis Burreson, and I am a table olive grower.

SENATOR WOLK: Welcome.

MR. BURRESON: And I basically came to find out what was going on here, and I found that we could have had this meeting and we have very similar situations and problems. We came from ... our industry is basically a \$100 million farm gate with about 1,400 growers, about 28,000 acres; the same as what you've heard from the olive oil people. Unfortunately, we're coming from 40 down to 28.

I was back in Washington, D.C., and testified before the ITC, back in the early 2000's, about the subsidies that you've heard expressed here today. And at that time, they were about \$2 billion, and today they're probably close to double that. We're affected by the same kinds of problems—the flavor standards.

You know, I heard Adam talking about AD. We're governed by the same thing. We are a marketing order. In fact, I'm the vice chairman of the California Olive

Committee and the chairman of the research committee; part of that federal marketing order. The key to that, in my opinion, is going to be to make sure that the standard we're governed by is reasonably good flavor. My gosh! You know, that's a slippery slope. And we're working very close with UC Davis to try to get a better definition of that.

So I think that I'm here to basically say that we certainly support and we're certainly empathetic to what the olive oil industry is doing. I'm from Orland, California specifically. The synergies that we find between the two industries are becoming more and more each day.

SENATOR WOLK: Thank you for coming.

Any other public testimony? Please come forward. I think I saw you before.

MR. WHITLOW: Yes, you did, Senator.

SENATOR WOLK: You don't get much time. (Laughter)

MR. WHITLOW: I won't. I just wanted to clarify one thing that I think is important.

The UC Davis study was a very disciplined, rigorous study by a very well-established institution, and they applied the IOC standard to the oils that they tested, which included the taste panel—an IOC-certified taste panel. So I just want to clarify, Mr. Bauer is trying to discredit that test, saying that it was based on chemistry that is not recognized by the IOC. Well, that's fine. Those tests weren't recognized by the IOC, but the taste panel test is, and was conducted by an IOC-certified panel. Seventy-three percent of the supermarket oils failed the taste panel. And as Mr. Corti just clarified, taste panels are very rigorous institutions.

So I just wanted to make sure we understand, and I'm standing behind the rigors of the UC Davis test. All right?

SENATOR WOLK: Indeed. Thank you, Mr. Whitlow.

MR. WHITLOW: Thank you.

SENATOR WOLK: Further public comment? Come forward.

MR. JON FADHL: Hello, I'm Jon Fadhl, Jovia Groves Olive Oil in Dixon, California.

SENATOR WOLK: Welcome.

MR. FADHL: The people that you heard speak today are the big growers. I'm an artisan grower. The problem that I face is amplified. You know, when you're

talking to these people who can fight the business with the economies of scales, I appreciate that. They're doing me a great favor and helpful. But as a small family farm, I'm beat by that economies of scales, and it's even hampered more when I'm trying to fight these adulterated products that are coming into our country. So anything that you could do to help the industry, help me as a grower, would be wonderful.

Thank you.

SENATOR WOLK: I appreciate that. Thank you. We have artisan producers on our Olive Oil Advisory Committee for precisely that reason. These are issues that affect everyone, and we look forward to working with everyone to come forward with our next proposals.

Any other public comment? Just come forward. Welcome.

MR. _____: Thank you. I represent the consumer, and I wondered if there's a clarification on the "Buy America" list? Over the week, there seems to be some confusion whether or not extra virgin olive oil is on the "Buy America" list. I think it was discussed briefly, and somebody indicated that not only is it on the ... not on the "Buy America" list, but it may have been excluded, and it'd be helpful, I think, to get some clarification to that.

Thank you.

SENATOR WOLK: All right. A good point. We'll look into that. Thank you.

Further public comment?

All right. Well, I would like to thank everyone for coming. Our panelists, I believe, were excellent, and thanks to the public for coming as well. I wish you all good eating with good olive oil.

Thanks.

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U.C. DAVIS
OLIVE OIL STUDIES

JULY 2010

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APRIL 2011

Report

Tests indicate that imported “extra virgin” olive oil often fails international and USDA standards

Frankel, E. N.; Mailer, R. J.; Shoemaker, C. F.; Wang, S. C.; Flynn, J. D.



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July 2010



Robert Mondavi Institute for Wine and Food Science
University of California, Davis

Tests indicate that imported "extra virgin" olive oil often fails international and USDA standards - UC Davis Olive Center, July 2010

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AUTHORS

Dr. Edwin N. Frankel, Scientific Advisor. Dr. Frankel is among the world's leading authorities on lipid oxidation. An adjunct professor at the UC Davis Department of Food Science and Technology, he ranked in 2003-04 as the world's most-cited author of agricultural research by the Institute for Scientific Information. Most recently he has authored "Chemistry of Extra Virgin Olive Oil: Adulteration, Oxidative Stability, and Antioxidants," *Journal of Agricultural and Food Chemistry*, 2010, 58, 5991-6006.



Dr. Rodney J. Mailer, Co-Investigator. Dr. Mailer has been involved in olive research since 1996, and is the principal research scientist at the Australian Oils Research Laboratory in Wagga Wagga, NSW. He heads the laboratory's edible oil research program, which plays a leading role in national olive industry research, and is the Australian representative on the International Standards Organization (ISO) for Fats and Oils.

Dr. Charles F. Shoemaker, Co-Investigator. Dr. Shoemaker is the co-chairman of the UC Davis Olive Center and a professor in the UC Davis Department of Food Science and Technology. He supervises the UC Davis Olive Oil Chemistry Laboratory. Dr. Shoemaker is a specialist in food emulsions, micelles, microemulsions, and food separations.



Dr. Selina C. Wang, Co-Investigator. Dr. Wang received her Ph.D. in Chemistry from UC Davis in 2008. She has since lectured for the UC Davis Department of Food Science and Technology and is a research associate at the UC Davis Olive Oil Chemistry Laboratory.

Dan Flynn, Consultant. Mr. Flynn is the executive director of the UC Davis Olive Center, the only center of its kind in North America. He leads the center's efforts to promote research and education.



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CONTENTS

EXECUTIVE SUMMARY	2
INTRODUCTION	4
BACKGROUND	4
METHODOLOGY	5
<i>Table 1. IOC- and USDA-adopted chemistry and sensory testing methods used in this study</i>	5
<i>Table 2. Other testing methods used in this study</i>	6
RESULTS	7
<i>Table 3. Chemistry and sensory data provided by Australian Oils Research Laboratory</i>	8
CONCLUSIONS	9
RECOMMENDATIONS FOR FUTURE RESEARCH	10

Tests indicate that imported “extra virgin” olive oil often fails international and USDA standards - UC Davis Olive Center, July 2010

EXECUTIVE SUMMARY

The UC Davis Olive Oil Chemistry Laboratory collaborated with the Australian Oils Research Laboratory to evaluate the quality of extra virgin olive oils sold on retail shelves in California. The two laboratories evaluated the oils based on standards and testing methods established by the International Olive Council (IOC) and United States Department of Agriculture (USDA), as well as several newer standards and testing methods adopted in Germany and Australia. These latter tests were adopted to help detect the adulteration of extra virgin olive oils with refined olive oils.

Our laboratory tests found that samples of imported olive oil labeled as “extra virgin” and sold at retail locations in California often did not meet international and US standards. Sensory tests showed that these failed samples had defective flavors such as rancid, fusty, and musty. Negative sensory results were confirmed by chemical data in 86 percent of the cases. Our chemical testing indicated that the samples failed extra virgin standards for reasons that include one or more of the following:

- oxidation by exposure to elevated temperatures, light, and/or aging;
- adulteration with cheaper refined olive oil;
- poor quality oil made from damaged and overripe olives, processing flaws, and/or improper oil storage.

Our laboratory tests indicated that nine of ten California samples were authentic extra virgin olive oils, with one California sample failing the IOC/USDA sensory standard for extra virgin.

Our laboratory tests indicated that the IOC and USDA chemistry standards often do not detect defective olive oils that fail extra virgin sensory standards. The IOC/USDA standards would be more effective in assessing and enforcing olive oil quality by including the German/Australian 1,2-diacylglycerol (DAGs) and pyropheophytins (PPP) standards. An elevated level of DAGs indicates that the samples were oxidized, of poor quality, and/or adulterated with cheaper refined oils, while an elevated level of PPP indicates that the samples were oxidized and/or adulterated with cheaper refined oils.

Specific findings of our tests include (see Table 3 for summary of results):

- 69 percent of imported olive oil samples and 10 percent of California olive oil samples labeled as extra virgin olive oil failed to meet the IOC/USDA sensory (organoleptic) standards for extra virgin olive oil. The Australian sensory panel found that each of these samples scored a median of up to 3.5 sensory defects such as rancid, fusty, and musty and were classified at the lower grade of “virgin.” Sensory defects are indicators that these samples are oxidized, of poor quality, and/or adulterated with cheaper refined oils.
- 31 percent of the imported samples that failed the sensory standards also failed the IOC/USDA standards for UV absorbance of oxidation products (K232 and K268), which indicates that these samples were oxidized and/or were of poor quality.
- 83 percent of the imported samples that failed the IOC/USDA sensory standards also failed the German/Australian DAGs standard. Two additional imported samples that met the IOC/USDA sensory standard for extra virgin failed the DAGs standard.

- 52 percent of the imported samples that failed the IOC/USDA sensory standards also failed the German/Australian PPP standard. Two additional imported samples that had met the IOC/USDA sensory standard for extra virgin failed the PPP standard.
- The IOC/USDA chemistry standards confirmed negative sensory results in 31 percent of cases, while the German/Australian DAGs and PPP standards confirmed negative sensory results in 86 percent of cases.

INTRODUCTION

“Extra virgin” is the top grade of olive oil according to standards established by the International Olive Council (IOC) and the United States Department of Agriculture (USDA). In addition to establishing chemistry standards for extra virgin, the IOC/USDA have established a sensory standard — the oil must have zero defects and greater than zero fruitiness. Over the past several years, trained olive oil tasters who have served on IOC-recognized sensory panels have reported to the UC Davis Olive Center that much of the olive oil sold in the United States as “extra virgin” does not meet this modest sensory standard.

Moreover, there have been media reports of fraud in the olive oil business, where extra virgin olive oils have been adulterated with cheaper refined oils such as hazelnut oil. Another method is to adulterate extra virgin olive oil with cheaper refined olive oil, thereby making chemical detection of adulteration more difficult.¹

In this report, the UC Davis Olive Oil Chemistry Laboratory collaborated with the Australian Oils Research Laboratory to evaluate the quality of extra virgin olive oils sold on retail shelves in California. The two laboratories evaluated the oils based on standards and testing methods established by the IOC and USDA as well as by several newer standards and testing methods adopted in Germany and Australia. The German government and the Australian Olive Association adopted these tests to help detect the adulteration of extra virgin olive oils with refined olive oils.

BACKGROUND

The IOC “is the world’s only international intergovernmental organisation in the field of olive oil and table olives. It was set up in Madrid, Spain, in 1959, under the auspices of the United Nations.”² The IOC’s duties include adopting standards and quality-management guides for industry; developing chemical and sensory testing methods to assess olive oil quality; and providing official recognition to laboratories that demonstrate proficiency in employing the IOC’s recommended testing methods.³

IOC member nations “account for 98% of world olive production, located primarily in the Mediterranean region.”⁴ The United States is not a member of the IOC, although the USDA recently adopted olive oil standards that closely correspond to the IOC standards, which will go into effect on October 25, 2010. The IOC/USDA olive oil standards include, among others, the grades of extra virgin, virgin, refined olive oil and “olive oil” (a blend of virgin olive oil and refined olive oil).⁵

¹ See for example, Mueller, Tom, “Slippery Business,” *The New Yorker*, August 13, 2007; Orson, Dione, “Connecticut Puts the Squeeze on Olive Oil Fraud,” *National Public Radio*, December 18, 2008; and Weise, Elizabeth, “Something Fishy? Counterfeit Foods Enter the U.S. Market,” *USA Today*, January 23, 2009.

² International Olive Council (IOC) website (<http://www.internationaloliveoil.org/>), English version, viewed July 2, 2010.

³ See IOC COI/T.15/NC No. 3/Rev. 4-November 2009 for olive oils standards; IOC COI/OT/NC No. 1-December 2004 for table olives standards; IOC COI/T.33/Doc. No. 2-4-2006, IOC COI/T.33-1/Doc. No. 2-2-2006, IOC COI/T.33-1/Doc. No. 4-2006, and IOC COI/T.33-2/Doc. No. 4-2006 for quality management guides; Table 1 for chemistry and sensory testing methods; IOC COI/T.21/Doc. No. 13/Rev.12-2009 and IOC COI/T.28/Doc. No. 3/Rev.12-2009 for recognition schemes and chemical and sensory testing laboratories, respectively.

⁴ IOC website, *Op.cit.*

⁵ See IOC COI/T.15/NC No. 3/Rev. 4 November 2009 for IOC standards and USDA, “United States Standards for Grades of Olive Oil and Olive-Pomace Oil,” *Federal Register*, April 28, 2010.

METHODOLOGY

Testing Methods. The analytical methods used in this study and described in Table 1 include the chemistry and sensory testing methods adopted by the IOC and USDA. The study employed additional testing methods to analyze olive oil quality, which are summarized in Table 2. These supplementary methods, which have not

Table 1. IOC- and USDA-adopted chemistry and sensory testing methods used in this study

IOC/USDA ANALYSIS	DETERMINATIONS	INDICATORS*	ANALYSES	EXTRA VIRGIN STANDARDS
Free Fatty Acids (FFA)	Free fatty acids are formed by the hydrolysis of the triacylglycerols in oils during extraction, processing, and storage.	An elevated level of free fatty acid indicates hydrolyzed, oxidized and/or poor-quality oil.	Analytical titration (AOCS Ca 5a-40).	Units: % as oleic acid Limit: ≤ 0.8
Peroxide Value (PV)	Peroxides are primary oxidation products that are formed when oils are exposed to oxygen, producing undesirable flavors and odors.	An elevated level of peroxides indicates oxidized and/or poor-quality oil.	Analytical titration (AOCS Cd 8b-90).	Units: mEq O ₂ /kg oil Limit: ≤ 20 .
UV Absorption (for conjugated double bonds)	Conjugated double bonds are formed from natural nonconjugated unsaturation in oils upon oxidation.	An elevated level of UV absorbance indicates oxidized and/or poor quality oil.	UV spectrophotometry (AOCS Ch 5-91).	Units: K ^{1%} _{1cm} . Limits for K232, K268 and ΔK: ≤ 2.50 , ≤ 0.22 , and ≤ 0.01 .
Stigmastadiene	Stigmastadienes are produced by thermal dehydration of β-sitosterol, a natural sterol found in virgin olive oils.	An elevated level of stigmastadienes indicates adulteration with refined oil.	Gas chromatography (GC) (IOC COI/T.20/Doc No. 11-2001)	Units: mg/kg oil IOC limit: ≤ 0.10 USDA limit: ≤ 0.15
Fatty Acid Profile (FAP)	Fatty acids constitute the principal component of fats (saturated or unsaturated). Fatty acid profiles (FAP) are distinguishable markers between olive oils and some seed/nut oils (FAPs vary slightly depending on the varieties and growing region of olives).	Analysis of the fatty acid profile provides information on the authenticity of the olive oil; an indicator for adulteration with refined oils.	Gas chromatography (GC) (IOC COI/T.20/Doc No. 24-2001).	Units: % of total fatty acids. Limits: See Appendix.
Sterols Profile	Sterols are minor constituents of oils and are distinguishable markers between olive oils and some seed/nut oils.	Analysis of sterols provides information on the purity of the olive oil; an indicator for adulteration with refined seed/nut oils, although some sterol values may exceed IOC limits due to climate and olive varietal.	Gas chromatography (GC) (IOC COI/T.20/Doc No. 10-2001).	Units: % of total sterols (mg/kg). Limits: See Appendix.
Sensory (Organoleptic)	Sensory refers to taste, odor and mouthfeel.	Sensory assessment can help identify oils that are of poor quality, oxidized, and/or adulterated with other oils.	IOC-recognized panel of 8 - 12 people evaluates oils for sensory characteristics (IOC COI/T.20/Doc No. 15/Rev. 2-2007, IOC COI/T.15/NC No 3/Rev. 4, 11-2009).	Panel must find median of defects = 0 and median of the fruity attribute > 0.

***Hydrolyzed** means oils in which triacylglycerols have been broken down via addition of water.

Oxidized means oils that have become stale and rancid through oxidation, a chemical reaction that is promoted by heat, light, and/or age.

Refined means cheaper, lower-grade oils that are solvent extracted, thermally deodorized and bleached.

Poor quality means oils that were made from poor-quality olives, improperly processed, and/or improperly stored after processing.

Table 2. Other testing methods used in this study

OTHER ANALYSIS	DETERMINATIONS	INDICATORS*	ANALYSIS	EXTRA VIRGIN STANDARDS
Total Polyphenol Content	Polyphenols are important antioxidants that inhibit oxidation and improve the shelf-life of olive oils.	Polyphenol content decreases with prolonged storage, but because polyphenols are influenced by varietal, horticultural, and processing variables the content does not necessarily indicate oil authenticity or quality.	Modified Gutfinger (1981) method. Gutfinger, T. (1981). “Polyphenols in olive oils.” <i>Journal of the American Oil Chemists’ Society</i> 62: 895–898.	Units: mg caffeic acid/kg oil. Limit: Extra virgin standards have not been established.
Triacylglycerols (TAGs)	Triacylglycerols are the principal components (98%) of olive oil consisting of an ester of three fatty acids and glycerol.	The triacylglycerols method is still being evaluated as an indicator of olive oil purity.	(Gas chromatography (GC) DGF Standard method C-VI 10b).	Units: % of total triacylglycerols. Limits: Extra virgin standards have not been established.
1,2-Diacylglycerol Content (DAGs)	During the breakdown of triacylglycerols, diacylglycerols are formed. Fresh extra virgin olive oil contains a high proportion of 1,2-diacylglycerols to 1,2- and 1,3-diacylglycerols, while olive oil from poor quality fruits and refined olive oil have elevated levels of 1,3-diacylglycerols.	The ratio of 1,2-diacylglycerols to 1,2- and 1,3-diacylglycerols is an indicator for oil that is hydrolyzed, oxidized, of poor quality, and/or adulterated with refined oil.	Gas chromatography (GC) (DGF Standard Method C-VI 16(06) – ISO 29822:2009).	Units: % total 1,2- and 1,3-diacylglycerols. Australian Olive Association (AOA) limit: ≥ 40.
Pyropheophytins (PPP)	Chlorophyll pigments break down to pheophytins and then pyropheophytins upon thermal degradation of olive oil.	An elevated level of pyropheophytins is an indicator for oil that is oxidized and/or adulterated with refined oil.	High performance liquid chromatography (HPLC) (DGF Standard Method C-VI-15(06) – ISO 29841:2009.)	Units: % total pheophytins. Australian Olive Association (AOA) limit: ≤ 15.

* **Hydrolyzed** means oils in which triacylglycerols have been broken down via addition of water.

Oxidized means oils that have become stale and rancid through oxidation, a chemical reaction that is promoted by heat, light, and/or age.

Refined means cheaper, lower-grade oils that are solvent extracted, thermally deodorized and bleached.

Poor quality means oils that were (1) made from poor-quality olives, (2) improperly processed, and/or (3) improperly stored after processing.

been adopted by the IOC and USDA, are total polyphenol content, triacylglycerols (TAGs), 1,2-diacylglycerol content (DAGs) and pyropheophytins (PPP). Standards for DAGs and PPP were developed by the German Fat and Oil Society (DGF) and were recently adopted by the German government and the Australian Olive Association (AOA) as useful tools to assess olive oil quality.⁶ Tests were performed “blind,” without knowledge of brand name or origin, by research and technical personnel within the California and Australian laboratories.

Sample Collections. The UC Davis research team collected 14 imported brands and five California brands of extra virgin olive oils from three different regions of California (County of Sacramento, San Francisco Bay Area, and County of Los Angeles) from March 3, 2010 to March 10, 2010. A member of the research team purchased three bottles of each brand in retail stores in each of the three regions for each of the imported brands. A member of the research team purchased three bottles of each of the California brands in the

⁶ The methods were developed in Germany by Dr. Christian Gertz at the DGF <http://www.dgfett.de/>. The DGF mission: “The DGF is the German network for science and technology of fats, oils and lipids. It will bring together professionals of science, technology and business together to promote scientific research and practical, to improve training and to facilitate information exchange.” The DAGs and PPP standards must be met by members of the Australian Olive Association (AOA) to receive AOA certification for extra virgin olive oil. The AOA intends to propose that the DAGs and PPP standards be adopted by the Australian government.

Sacramento and San Francisco Bay Area regions only — the Los Angeles County locations did not stock the California brands. The Appendix includes a list identifying the supermarket purchase locations.

Australia Analysis. In March 2010, the UC Davis olive oil research project team shipped three samples of each imported brand and two samples of each California brand (one sample from each city in which the brand was purchased) to the Australian Oils Research Laboratory in Wagga Wagga, New South Wales. The samples were shipped by FedEx and were five days in transit. The laboratory is recognized by the IOC to provide chemical analysis of olive oil. The Australian laboratory directed the Australian Olive Oil Sensory Panel in Wagga Wagga to conduct sensory analysis of the samples. This panel is recognized by the IOC as qualified to provide sensory analysis of olive oil. The Australian Oils Research Laboratory used the chemical testing methods listed in Table 1 and Table 2 and the Australian Olive Oil Sensory Panel used the sensory methods identified in Table 1. Results from the Australian analysis are summarized in Table 3 and provided in their entirety in the Appendix.

UC Davis Analysis. The UC Davis olive oil research project team analyzed three regional samples of each imported brand and analyzed two regional samples of each California brand (one sample from each region in which the brand was purchased). The lot numbers for the UC Davis samples matched those of the Australian samples in almost all cases. The Appendix indicates the four instances in which the lot numbers were not identical. The samples were analyzed in the laboratory of Dr. Charles F. Shoemaker located on campus. The analytical team was supervised by Dr. Edwin N. Frankel, Dr. Selina C. Wang, and Dr. Charles F. Shoemaker. The UC Davis laboratory analyzed each of the samples using the testing methods identified in Table 1 and Table 2 except for the stigmastadiene, sterols, triacylglycerols (TAGs) and sensory methods. Some of the testing methods (total polyphenol contents and DAGs) are ongoing at UC Davis. The Appendix includes the results of the UC Davis analysis.

RESULTS

The Australian and UC Davis results are highly correlated for the samples with the same lot numbers. See Appendix for a comparison of the results of the two laboratories, and see Table 3 for a summary of the Australian results upon which we base the following findings:

- 69 percent of imported olive oil samples and 10 percent of California olive oil samples labeled as extra virgin olive oil failed to meet the IOC/USDA sensory (organoleptic) standards for extra virgin olive oil. The Australian sensory panel found that each of these samples contained a median of up to 3.5 sensory defects such as rancid, fusty, and musty and were classified at the lower grade of “virgin.” Sensory defects are indicators that these samples are oxidized, of poor quality, and/or adulterated with cheaper refined oils.
- 31 percent of the imported samples that failed the sensory standards also failed the IOC/USDA standards for UV absorbance of oxidation products (K232 and K268), which indicates that these samples were oxidized and/or were of poor quality.
- 83 percent of the imported samples that failed the IOC/USDA sensory standards also failed the German/Australian DAGs standard. Two additional imported samples that met the IOC/USDA sensory standard for extra virgin failed the DAGs standard. An elevated level of DAGs indicates that the samples were oxidized, adulterated with cheaper refined oils, and/or of poor quality.

Tests indicate that imported "extra virgin" olive oil often fails international and USDA standards
UC Davis Olive Center, July 2010

Table 3. Chemistry and sensory data provided by Australian Oils Research Laboratory

Brand		PV	K232	K268	ΔK	FFA	Stigma	Poly	PPP	DAGs	Sensory
Extra Virgin Standards*		(≤0.3)	(≤2.5)	(≤0.25)	(≤0.01)	(≤0.8)	(≤0.10)	(N/A)	(≤1.5)	(≤0.7)	(≤1.5)
Filippo Berio	SAC	11	2.46	0.18	<0.003	0.30	<0.03	200	10.3	42.2	EXTRA VIRGIN
	SF	12	2.18	0.14	<0.003	0.37	<0.03	212	12.0	40.7	VIRGIN
	IA	11	2.12	0.15	<0.003	0.35	<0.03	247	13.7	42.0	VIRGIN
Bertolli	SAC	9	2.29	0.19	<0.003	0.41	<0.03	195	17.8	38.1	VIRGIN
	SF	9	2.24	0.16	<0.003	0.38	<0.03	266	14.3	39.2	VIRGIN
	IA	12	2.42	0.17	<0.003	0.32	<0.03	199	20.8	43.4	VIRGIN
Pompeian	SAC	11	2.50	0.19	<0.003	0.59	<0.03	132	12.1	38.5	VIRGIN
	SF	13	2.60	0.16	<0.003	0.51	<0.03	111	10.5	31.5	VIRGIN
	IA	13	2.56	0.17	<0.003	0.49	<0.03	188	16.3	35.9	VIRGIN
Colavita	SAC	9	1.97	0.13	<0.003	0.44	<0.03	268	1.4	72.9	EXTRA VIRGIN
	SF	11	2.13	0.15	<0.003	0.57	<0.03	189	12.8	36.7	VIRGIN
	IA	15	2.88	0.25	0.01	0.72	<0.03	156	33.1	79.0	VIRGIN
Star	SAC	9	2.29	0.15	<0.003	0.49	<0.03	194	12.8	36.4	VIRGIN
	SF	11	2.38	0.14	<0.003	0.47	<0.03	164	17.7	33.7	EXTRA VIRGIN
	IA	10	2.25	0.15	<0.003	0.45	<0.03	237	8.3	47.3	EXTRA VIRGIN
Carapelli	SAC	10	2.42	0.20	<0.003	0.49	<0.03	196	30.6	29.4	VIRGIN
	SF	10	2.43	0.21	<0.003	0.48	<0.03	208	29.3	29.1	VIRGIN
	IA	10	2.65	0.20	<0.003	0.45	<0.03	219	17.2	39.2	VIRGIN
Newmans Own Organics	SAC	10	2.55	0.20	<0.003	0.43	<0.03	165	13.7	36.3	VIRGIN
	SF	9	2.49	0.17	<0.003	0.42	<0.03	176	14.0	35.5	VIRGIN
	IA	9	2.36	0.17	<0.003	0.43	<0.03	211	9.8	39.5	EXTRA VIRGIN
Mezzetta	SAC	10	2.31	0.20	0.01	0.50	0.07	131	18.4	32.2	VIRGIN
	SF	10	2.33	0.18	<0.003	0.52	0.08	133	16.6	31.0	VIRGIN
	IA	11	2.34	0.17	<0.003	0.51	0.09	125	16.8	32.5	VIRGIN
Mazola	SAC	13	2.65	0.19	<0.003	0.65	<0.03	152	21.7	31.4	VIRGIN
	SF	12	2.70	0.19	<0.003	0.65	<0.03	159	21.7	30.1	VIRGIN
	IA	15	3.14	0.17	<0.003	0.50	<0.03	103	14.0	39.0	VIRGIN
Rachael Ray	SAC	10	2.42	0.21	<0.003	0.43	<0.03	258	12.9	36.4	VIRGIN
	SF	9	2.43	0.19	<0.003	0.41	<0.03	239	12.2	36.3	VIRGIN
	IA	9	2.08	0.15	<0.003	0.43	<0.03	324	2.0	72.1	EXTRA VIRGIN
Kirkland Organic	SAC	9	2.24	0.16	<0.003	0.33	<0.03	244	16.7	42.8	EXTRA VIRGIN
	SF	9	2.13	0.16	<0.003	0.26	<0.03	298	8.8	57.4	EXTRA VIRGIN
	IA	7	2.10	0.15	<0.003	0.27	<0.03	292	11.8	55.6	EXTRA VIRGIN
Great Value 100%	SAC	11	2.23	0.13	<0.003	0.35	0.05	161	12.4	45.3	EXTRA VIRGIN
	SF	11	2.23	0.13	<0.003	0.33	0.05	163	12.7	44.6	EXTRA VIRGIN
	IA	10	2.18	0.14	<0.003	0.57	<0.03	185	10.0	45.3	VIRGIN
Safeway Select	SAC	12	2.74	0.19	<0.003	0.84	0.03	141	19.7	29.3	VIRGIN
	SF	11	2.19	0.15	<0.003	0.58	<0.03	213	6.0	45.5	VIRGIN
	IA	11	2.20	0.15	<0.003	0.55	<0.03	219	6.1	47.9	EXTRA VIRGIN
365 100% Italian	SAC	11	1.95	0.15	<0.003	0.26	<0.03	112	40.7	32.0	VIRGIN
	SF	10	1.90	0.15	<0.003	0.28	<0.03	112	40.8	31.2	VIRGIN
	IA	10	2.14	0.14	<0.003	0.31	<0.03	140	12.4	53.8	EXTRA VIRGIN
Corto Olive	SAC	7	1.73	0.11	<0.003	0.19	<0.03	82	8.1	59.3	EXTRA VIRGIN
	SF	9	1.74	0.10	<0.003	0.20	<0.03	77	8.1	59.1	EXTRA VIRGIN
California Olive Ranch	SAC	9	2.19	0.12	<0.003	0.22	<0.03	109	11.9	52.0	EXTRA VIRGIN
	SF	9	2.19	0.13	<0.003	0.22	<0.03	102	11.9	52.9	EXTRA VIRGIN
McEvoy Ranch Organic	SAC	7	2.05	0.13	<0.003	0.16	<0.03	380	5.0	82.6	EXTRA VIRGIN
	SF	7	2.12	0.13	<0.003	0.16	<0.03	370	4.8	83.1	EXTRA VIRGIN
Bariani	SAC	9	2.18	0.13	<0.003	0.37	<0.03	373	7.5	64.8	VIRGIN
	SF	9	2.16	0.17	<0.003	0.38	<0.03	381	7.4	64.5	EXTRA VIRGIN
Lucero (Ascolano)	SAC	10	2.08	0.15	<0.003	0.28	<0.03	234	9.4	54.8	EXTRA VIRGIN
	SF	13	2.08	0.15	<0.003	0.30	<0.03	238	9.4	54.6	EXTRA VIRGIN

* ICA: USDA standards except Poly (no standards) and DAGs and PPP (only virgin standards adopted by Germany & Australia (DIN & Australian Govt. standards only).

PV: Peroxide Value (mEq O₂/kg); K232, K268 and ΔK (K²₁₅₋₁₈); FFA: Free Fatty Acids (% as oleic acid); PPP: Pyrophosphoryl A (% of total phenolics); DAGs: 1,2-Diacylglycerols (% of total 1,2- & 1,3-diacylglycerols); Stigma: Stigmastadiene (mg/kg); Poly: total polyphenol content (mg caffeic acid/kg).

- 52 percent of the imported samples that failed the IOC/USDA sensory standards also failed the German/Australian PPP standard. Two additional imported samples that had met the IOC/USDA sensory standard for extra virgin failed the PPP standard. An elevated level of PPP indicates that the samples were oxidized and/or adulterated with cheaper refined oils.
- All but one of the imported oil samples were well within the limit for free fatty acids (FFA). California oils generally had lower FFA values (0.16-0.38) than those of imported oils (0.26-0.84).
- In the sterol profile (see Appendix), one imported oil sample and one California oil sample slightly exceeded the IOC value for campesterol, although both samples were within the USDA standard.⁷ Campesterol levels can vary based on olive varieties and climate.⁸ In addition, one imported oil sample exceeded the IOC/USDA limit for diols.
- All samples were within the IOC/USDA limit for peroxide value (PV), ΔK, stigmastadiene, and fatty acid profile (FAP) (see Appendix for fatty acid profile results).
- If any of the samples were adulterated, it is most likely that the adulterant was refined olive oil rather than refined nut, seed, or vegetable oils. Unless the adulteration levels were very small, the failed samples would not have met the IOC/USDA standards for fatty acid profile and sterol profile if adulterated with refined nut, seed, or vegetable oils.
- The IOC/USDA chemistry standards confirmed negative sensory results in 31 percent of cases, while the German/Australian DAGs and PPP standards confirmed negative sensory results in 86 percent of cases.

CONCLUSIONS

Our laboratory tests found that samples of imported olive oil labeled as “extra virgin” and sold at retail locations in California often did not meet international and US standards. Sensory tests showed that these failed samples had defective flavors such as rancid, fusty, and musty. Negative sensory results were confirmed by chemical data in 86 percent of the cases. Our chemical testing indicated that the samples failed extra virgin standards for reasons that include one or more of the following:

- oxidation by exposure to elevated temperatures, light, and/or aging;
- adulteration with cheaper refined olive oil;
- poor quality oil made from damaged and overripe olives, processing flaws, and/or improper oil storage.

Our laboratory tests indicated that nine of ten California samples were authentic extra virgin olive oils, with one California sample failing the IOC/USDA sensory standard for extra virgin.

⁷ USDA standards require further confirmatory tests for levels of campesterol between 4.0 and 4.5 percent.

⁸ Aparicio, R., Ferreiro, L., and Alonso, V. “Effect of climate on the chemical composition of virgin olive oil.” *Analytica Chimica Acta*, **1994**, 292, 235–241 and Mailer, R. J. “The natural chemistry of Australian extra virgin olive oil,” *RIRDC Report #DAN-239A*, **2007** Publication No. 06/132.

Our laboratory tests indicated that the IOC and USDA chemistry standards often do not detect defective olive oils that fail extra virgin sensory standards. The IOC/USDA standards would be more effective in assessing and enforcing olive oil quality by including the German/Australian DAGs and PPP standards. An elevated level of DAGs indicates that the samples were oxidized, of poor quality, and/or adulterated with cheaper refined oils, while an elevated level of PPP indicates that the samples were oxidized and/or adulterated with cheaper refined oils.

RECOMMENDATIONS FOR FUTURE RESEARCH

In addition to adopting the DAGs and PPP testing methods, the IOC/USDA standards would benefit from the development of improved chemical testing methods for extra virgin olive oils:

- Based on the literature,⁹ analyses of TAGs by high-temperature gas chromatography (GC) do not agree with those by high-performance liquid chromatography (HPLC). Therefore, the GC analyses of TAGs should be supplemented by HPLC analyses.
- Supplement sensory testing by GC analysis of volatile flavor compounds in extra virgin olive oil to obtain more precise and diagnostic chemical information.
- Determine the effects of minor constituents, including chlorophylls, carotenoids and metal impurities, which decrease the oxidative stability of extra virgin olive oil. Many of the imported olive oil samples that we analyzed were partially oxidized and of poor quality.

⁹ Resanko, I.; Mares, P. "Determination of plant triacylglycerols using capillary gas chromatography, high-performance liquid chromatography and mass spectrometry," *J. Chromatogr.* **1991**, *542*, 145–159 and Frankel, E. N. "Chemistry of Extra Virgin Olive Oil: Adulteration, Oxidative Stability, and Antioxidants," *J. Agric. Food Chem.*, **2010**, *58* (10), 5991–6006.

Report

Evaluation of Extra-Virgin Olive Oil Sold in California

Frankel, E. N.; Mailer, R. J.; Wang, S. C.; Shoemaker, C. F.; Guinard, J.-X.; Flynn, J. D.; Sturzenberger, N. D.



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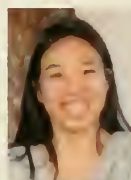
AUTHORS

Dr. Edwin N. Frankel, Scientific Advisor. Dr. Frankel is among the world's leading authorities on lipid oxidation. A former adjunct professor at the UC Davis Department of Food Science and Technology, he ranked in 2003-04 as the world's most-cited author of agricultural research by the Institute for Scientific Information. Recently he has authored "Chemistry of Extra Virgin Olive Oil: Adulteration, Oxidative Stability, and Antioxidants," *Journal of Agricultural and Food Chemistry*, **2010**, 58, 5991-6006 and "Nutritional and Biological Properties of Extra Virgin Olive Oil," *Journal of Agricultural and Food Chemistry*, **2011**, 59, 785-792.



Dr. Rodney J. Mailer, Co-Investigator. Dr. Mailer has been involved in olive research since 1996, and is the former principal research scientist and now a research fellow and adjunct professor at the Australian Oils Research Laboratory in Wagga Wagga, NSW. He headed the laboratory's edible oil research program, which plays a leading role in national olive industry research, and is the Australian representative on the International Standards Organization (ISO) for Fats and Oils.

Dr. Selina C. Wang, Co-Investigator. Dr. Wang received her Ph.D. in Chemistry from UC Davis in 2008. She has since lectured for the UC Davis Department of Food Science and Technology and is a research associate at the UC Davis Olive Oil Chemistry Laboratory, managing the analyses conducted in the laboratory.



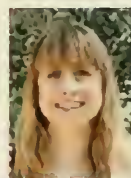
Dr. Charles F. Shoemaker, Co-Investigator. Dr. Shoemaker is the co-chairman of the UC Davis Olive Center and a professor in the UC Davis Department of Food Science and Technology. He supervises the UC Davis Olive Oil Chemistry Laboratory. Dr. Shoemaker is a specialist in food emulsions, micelles, microemulsions, and food separations.

Dr. Jean-Xavier Guinard, Co-Investigator. Dr. Guinard is a sensory scientist at the UC Davis Department of Food Science and Technology. He is the supervisor of the UC Davis Olive Oil Taste Panel. Recently he has co-authored "How do consumer hedonic ratings for extra virgin olive oil relate to the quality ratings by experts and descriptive analysis ratings?" *Food Quality and Preference*, **2011**, 22(2): 213-225



Dan Flynn, Consultant. Mr. Flynn is the executive director of the UC Davis Olive Center, the only center of its kind in North America. He leads the center's efforts to promote research and education for table olive and olive oil growers and processors.

Nicole Sturzenberger, Consultant. Ms. Sturzenberger is the assistant director of the UC Davis Olive Center. Among other duties, she manages and helps lead the UC Davis Olive Oil Taste Panel.



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CONTENTS

EXECUTIVE SUMMARY	2
INTRODUCTION	3
METHODOLOGY	3
<i>Table 1. Chemistry and sensory testing methods used in this study</i>	
RESULTS BASED ON IOC STANDARDS FOR EXTRA VIRGIN OLIVE OILS	5
<i>Table 2. Both sensory panels find that top-selling brands usually fail IOC extra virgin olive oil standards</i>	
<i>Table 3. IOC chemical tests show low failure rates for most brands</i>	
RESULTS BASED ON GERMAN/AUSTRALIAN STANDARDS FOR EXTRA VIRGIN OLIVE OILS	6
<i>Table 4. German/Australian tests show significant failure rates</i>	
RELATIONSHIP BETWEEN SENSORY AND CHEMISTRY ANALYSES	7
<i>Table 5. German/Australian chemical tests confirm failed sensory samples more frequently than IOC tests</i>	
CONCLUSIONS	8
RECOMMENDATIONS FOR FUTURE RESEARCH	8
APPENDIX	
<i>Sample information</i>	
<i>Sensory Data from Australian Oils Research Labaratory and UC Davis Panels</i>	
<i>Chemistry Laboratory Data fram Australian Oils Research Labaratory</i>	

EXECUTIVE SUMMARY

While there are many excellent imported and domestic extra virgin olive oils available in California, our findings indicate that the quality level of the largest imported brand names is inconsistent at best, and that most of the top-selling olive oil brands we examined regularly failed to meet international standards for extra virgin olive oil.

In this second and final report in a year-long study, UC Davis again worked with the Australian Oils Research Laboratory to evaluate the quality of extra virgin olive oils sold on retail shelves in California. The two laboratories evaluated the oils based on standards and testing methods established by the International Olive Council (IOC). The laboratories also examined oils based on methods adopted in Germany and Australia. The labs evaluated oils in the same manner as if the oils had been submitted by a private party seeking an evaluation. The average purchase price of the top-selling imported brands was \$0.47/ounce, the California brand was \$0.46/ounce, Australian brand was \$0.42/ounce, and the top-selling premium Italian brand was \$0.89/ounce.

In contrast to the first UC Davis report of July 2010, which analyzed 52 samples of 14 brands, this report's aim was to analyze fewer brands but more samples of each brand so as to improve the analysis of each brand. In addition, this study used two IOC-accredited sensory panels to conduct analysis based on the IOC sensory standards for extra virgin olive oil, in contrast to the July study, which used a single sensory panel to analyze samples. With this study and the July 2010 study, the research team has analyzed a total of 186 extra virgin olive oil samples in the past year, offering a statistically significant picture of olive oil quality sold in California, the most-populous state in the world's third-largest olive oil consuming nation. Among the findings:

- Of the five top-selling imported "extra virgin" olive oil brands in the United States, 73 percent of the samples failed the IOC sensory standards for extra virgin olive oils analyzed by two IOC-accredited sensory panels. The failure rate ranged from a high of 94 percent to a low of 56 percent depending on the brand and the panel. None of the Australian and California samples failed both sensory panels, while 11 percent of the top-selling premium Italian brand samples failed the two panels. Sensory defects are indicators that these samples are oxidized, of poor quality, and/or adulterated with cheaper refined oils.
- All of the oil samples passed the IOC chemistry standards for free fatty acids (FFA), fatty acid profile (FAP) and peroxide value (PV), but several of the imported samples failed the IOC's ultraviolet absorption (UV) tests.
- 70 percent of the samples from the five top-selling imported brands failed the German/Australian 1,2-diacylglycerol content (DAGs) test and 50 percent failed the German/Australian pyropheophytin (PPP) test. All of the 18 samples of the California brand passed the DAGs test and 89 percent of the samples passed the PPP test. The Italian premium brand failed the DAGs and PPP tests in about one-third of the samples. The Australian brand passed the DAGs test in all cases and failed the PPP test in all cases.
- The strongest relationship between chemical analysis and negative sensory results was found in the DAGs test (65 percent), followed by the PPP test (49 percent), UV K268 for conjugated trienes (34 percent), UV K232 for conjugated dienes (12 percent) and UV ΔK (6 percent). The FFA, FAP and PV tests did not confirm negative sensory results. The IOC standards would be more effective in assessing and enforcing olive oil quality by including the DAGs and PPP standards.

Our testing indicated that the samples failed extra virgin olive oil standards according to one or more of the following: (a) oxidation by exposure to elevated temperatures, light, and/or aging; (b) adulteration with cheaper refined olive oil; and (c) poor quality oil made from damaged and overripe olives, processing flaws, and/or improper oil storage.

We recommend pursuing further research on the following topics: (1) investigate chemical markers of sensory defects, (2) determine the effects of minor constituents on oxidative stability and flavor deterioration and (3) establish chemical profiles of California olive oils.

INTRODUCTION

While there are many excellent imported and domestic extra virgin olive oils available in California, our findings indicate that the quality level of the largest imported brand names is inconsistent at best, and that most of the top-selling olive oils we examined regularly failed to meet international standards for extra virgin olive oil.

“Extra virgin” is the top grade of olive oil according to standards established by the International Olive Council (IOC) and the United States Department of Agriculture (USDA). In addition to establishing chemistry standards for extra virgin olive oil, the IOC and USDA have established a sensory standard — the oil must have zero defects and greater than zero fruitiness.

The IOC “is the world’s only international intergovernmental organisation in the field of olive oil and table olives. It was set up in Madrid, Spain, in 1959, under the auspices of the United Nations.”¹ The IOC’s duties include adopting standards for industry, developing chemical and sensory testing methods to assess olive oil quality, and providing official recognition to laboratories that demonstrate proficiency in employing the IOC’s recommended testing methods.² Although the United States is not a member of the IOC, the USDA recently adopted³ olive oil standards that closely correspond to the IOC standards.⁴ For simplicity, this report will reference the IOC standards and not the USDA standards. The IOC olive oil standards include the grades of extra virgin, virgin, refined olive oil and “olive oil” (a blend of virgin olive oil and refined olive oil).

In July 2010 the UC Davis Olive Center issued a report showing that 69 percent of imported olive oils labeled as “extra virgin” failed the IOC sensory standard - in other words, these oils were defective and failed to meet the international standard for extra virgin olive oil. In the months since the release of the study, similar quality problems have been found in Andalusia, the world’s most productive olive oil region, by Spanish authorities.⁵

In this second and final report of a year-long study, UC Davis again worked with the Australian Oils Research Laboratory to evaluate the quality of extra virgin olive oils sold on retail shelves in California. UC Davis and the Australian laboratory evaluated the oils based on standards and testing methods established by the IOC. Additionally, the two laboratories analyzed the oils using two testing methods adopted in Germany and Australia. The Australian Olive Association adopted these tests to help detect extra virgin olive oils that were old and oxidized and not up to extra virgin olive oil standards.

With this study and the July 2010 study, the research team has analyzed a total of 186 extra virgin olive oil samples in the past year, all purchased in California. In contrast, the IOC’s quality control program assessed an average of 116 extra virgin olive oil samples per year purchased in the entire United States and Canada in the 2008-2009 period.⁶ The UC Davis studies offer a statistically significant picture of extra virgin olive oil quality sold in California, the most populous state in the world’s third-largest olive oil consuming nation.

METHODOLOGY

Testing methods. The UC Davis and Australian laboratories examined oils in the same manner as if the oils had been submitted by a private party seeking an evaluation. The analytical methods used in this study, summarized in Table 1, include the chemistry and sensory testing methods adapted by the IOC. While not all of the IOC chemical tests were included in this study, the primary tests used by producers worldwide - free fatty acids (FFA), peroxide value (PV),

¹ International Olive Council (IOC) website (<http://www.internationaloliveoil.org/>), English version, viewed February 5, 2011.

² See IOC COI/T.15/NC No 3/Rev. 5 November 2010 for olive oils standards; IOC COI/OT/NC No. 1-December 2004 for table olives standards;; Table 1 of this report for chemistry and sensory testing methods, and <http://www.internationaloliveoil.org/estaticas/view/226-laboratories-panels> regarding IOC recognition of chemical and sensory testing laboratories.

³ See USDA, “United States Standards for Grades of Olive Oil and Olive-Pomace Oil,” *Federal Register*, April 28, 2010.

⁴ There are some differences between the IOC and USDA standards, such as allowable limits for campesterol in the grade of extra virgin olive oil and median panel scores for defects in the grade of virgin olive oil.

⁵ See Olive Oil Times, December 5, 2010.

⁶ See International Olive Council, CONV/R.36/Doc. Na 2, October 2009.

ultraviolet absorption (UV), fatty acid profile (FAP) and sensory, were included. The UV tests were particularly useful in our July 2010 study. The study also employed supplementary standards that have been adopted by the German government and the Australian Olive Association (AOA) as useful tools to assess olive oil quality.⁷ These methods, known as 1,2-diacylglycerol content (DAGs) and pyropheophytins (PPP), were developed by the German Fat and Oil Society (DGF). All tests were performed "blind," without knowledge of brand name or origin, by research and technical personnel within the California and Australian laboratories and by the sensory panels.

Sample selection. In contrast to the UC Davis report of July 2010, which analyzed 52 samples of 14 brands, this report's aim was to analyze fewer brands but more samples of each brand to improve the analysis of each brand. In addition, this study used two IOC-accredited sensory panels to conduct analysis based on the IOC sensory standards for extra virgin olive oil, in contrast to the July study, which used a single sensory panel to analyze samples. The UC

Table 1. Chemistry and sensory testing methods used in this study

	ANALYSIS	DETERMINATIONS	INDICATORS*	ANALYSES	EXTRA VIRGIN STANDARDS
IOC TESTS	Free Fatty Acids (FFA)	Free fatty acids are formed by the hydrolysis of the triacylglycerols in oils during extraction, processing, and storage.	An elevated level of free fatty acid indicates hydrolyzed, oxidized and/or poor-quality oil.	Analytical titration (AOCS Ca 5a-40).	Units: % as oleic acid. Limit: ≤ 0.8
	Peroxide Value (PV)	Peroxides are primary oxidation products that are formed when oils are exposed to oxygen, producing undesirable flavors and odors.	An elevated level of peroxides indicates oxidized and/or poor-quality oil.	Analytical titration (ISO 3960).	Units: mEq O ₂ /kg oil. Limit: ≤ 20 .
	UV Absorption (for conjugated double bonds)	Conjugated double bonds are formed from natural nonconjugated unsaturation in oils upon oxidation.	An elevated level of UV absorbance indicates oxidized and/or poor-quality oil.	UV spectrophotometry (COI/T20/Doc. No. 0019/Rev.3/2010).	Units: K ¹ ₂₃₂ Limits for K ₂₃₂ , K ₂₆₈ and ΔK : ≤ 2.50 , ≤ 0.22 , and ≤ 0.01 .
	Fatty Acid Profile (FAP)	Fatty acids constitute the principal component of fats (saturated or unsaturated). Fatty acid profiles (FAP) are distinguishable markers between olive oils and some seed/nut oils (FAPs vary slightly depending on the varieties and growing region of olives).	Analysis of the fatty acid profile provides information on the authenticity of the olive oil; an indicator for adulteration with refined oils.	Gas chromatography (GC) (IOC COI/T.20/Doc. No. 24-2001).	Units: % of total fatty acids.
	Sensory (Organoleptic)	Sensory refers to taste, odor and mouthfeel.	Sensory assessment can help identify oils that are of poor quality, oxidized, and/or adulterated with other oils.	IOC-recognized panel of 8–12 people evaluates oils for sensory characteristics (IOC COI/T.20/Doc. No. 15/Rev. 3, 11-2010, IOC COI/T.15/NC No. 3/Rev. 5, 11-2010).	Panel must find median of defects = 0 and median of the fruit attribute > 0.
GERMAN/AUSTRALIAN TESTS	1,2-Diacylglycerol Content (DAGs)	Fresh extra virgin olive oil contains a high proportion of 1,2-diacylglycerols to 1,2- and 1,3-diacylglycerols, while olive oil from poor quality fruits and refined olive oils have higher level of 1,3-DAGs than fresh extra virgin olive oils.	The ratio of 1,2-diacylglycerols to 1,2- and 1,3-diacylglycerols is an indicator for oil that is hydrolyzed, oxidized, of poor quality, and/or adulterated with refined oil.	Gas chromatography (GC) (DGF Standard Method C-VI 16[06] – ISO 29822:2009).	Units: % total 1,2- and 1,3-diacylglycerols. Australian Olive Association (AOA) limit: ≥ 40 .
	Pyropheophytins (PPP)	Chlorophyll pigments break down to pheophytins and then pyropheophytins upon thermal degradation of olive oil.	An elevated level of pyropheophytins is an indicator for oil that is oxidized and/or adulterated with refined oil.	High performance liquid chromatography (HPLC) (DGF Standard Method C-VI 15[06] – ISO 29841:2009.)	Units: % total pheophytins. Australian Olive Association (AOA) limit: ≤ 15 .

*Hydrolyzed means oils in which triacylglycerols have been broken down via addition of water.

Oxidized means oils that have become stale and rancid through oxidation, a chemical reaction that is promoted by exposure to oxygen, heat, light, and/or age.

Refined means cheaper, lower-grade oils that often are solvent extracted, thermally deodorized and bleached.

Poor quality means oils that were made from poor-quality olives, improperly processed, and/or improperly stored after processing.

⁷ The methods were developed in Germany by Dr. Christian Gertz at the DGF <http://www.dgfen.de/>. The DGF mission: "The DGF is the German network for science and technology of fats, oils and lipids. It will bring together professionals of science, technology and business together to promote scientific research and practical, to improve training and to facilitate information exchange." The DAGs and PPP standards must be met by members of the Australian Olive Association (AOA) to receive AOA certification for extra virgin olive oil. The Australian government is soliciting comment on a proposed national olive oil standard that includes the DAGs and PPP methods.

Davis research team identified eight brands of extra virgin olive oil for analysis, including the five top-selling brands in the United States⁸ (Filippo Berio, Bertolli, Pompeian, Colavita, and Star) as well as the top-selling brand from California (California Olive Ranch), the top-selling brand from Australia (Cobram Estate), and the top-selling premium Italian brand (Lucini).

Sample collection. The research team collected the oils from three different regions of California (County of Sacramento, San Francisco Bay Area, and County of Los Angeles) from September 9, 2010 to October 21, 2010. A member of the research team purchased each brand in two outlets of three leading supermarkets in each of the three regions for each of the eight brands, for a total of 18 samples of each brand (except for Cobram Estate, in which a total of eight samples were found among the supermarkets visited). A total of 134 samples were analyzed by the research team. Price information is provided in several of the tables, with the average purchase price of the top-selling brands at \$0.47/ounce, the California brand at \$0.46/ounce, the Australian brand at \$0.42/ounce, and the top-selling premium Italian brand at \$0.89/ounce.

Sample handling. A member of the research team transported the samples from the supermarket collection points to the UC Davis Olive Oil Chemistry Laboratory. Sacramento area samples arrived at the lab within three hours of collection and from the San Francisco Bay Area within four hours of collection. The Los Angeles area samples were shipped by overnight delivery to UC Davis. Ambient daytime temperature at time of collection ranged between 48°F (9°C) and 58°F (14°C). Once the samples arrived in the lab, the research team wrapped the samples in foil and stored them in a dark, secure cabinet. Temperature of the UC Davis laboratory was maintained at 64°F (18°C).

Australia analysis. On November 12, 2010, the UC Davis olive oil research project team shipped 134 unopened bottles (18 samples of seven brands and eight samples of one brand) to the Australian Oils Research Laboratory in Wagga Wagga, New South Wales. The samples were shipped by FedEx and were five days in transit. The laboratory is recognized by the IOC to provide chemical analysis of olive oil. The Australian laboratory directed the Australian Olive Oil Sensory Panel in Wagga Wagga to conduct sensory analysis of the samples. This panel is recognized by the IOC as qualified to provide sensory analysis of olive oil. The Australian sensory panel leader directed that the oils be first analyzed by “show judging” to determine whether some oils could be screened so as to reduce the time and cost of subjecting all of the oils to a full panel analysis. The “show judging” screened out any oils that achieved a score of 11.5 or higher on a 20-point scale (a score of 13 is the minimum for a Bronze medal in Australian show judging). Any oils that achieved a score of 11.5 or higher was assumed by the research team to be “extra virgin” grade for purposes of the Australian analysis. The Australian Oils Research Laboratory used the chemical testing methods listed in Table 1 and the Australian Olive Oil Sensory Panel used the sensory methods identified in Table 1.

UC Davis analysis. UC Davis analyzed the same (by lot number) unopened 134 samples that were analyzed by the Australian laboratory and sensory panel using the methods and standards identified in Table 1. The UC Davis Olive Oil Chemistry Laboratory analytical team was supervised by Dr. Selina C. Wang and Dr. Charles F. Shoemaker. The UC Davis laboratory is working to meet the requirements for achieving IOC recognition, and while the results of the analyses were comparable to the Australian laboratory, this report is based on chemical data solely from the Australian laboratory. The same 134 samples were analyzed by the UC Davis Olive Oil Taste Panel, which has been recognized by the IOC as qualified to provide sensory analysis of olive oil. Dr. Jean-Xavier Guinard and Nicole Sturzenberger supervised the work of the taste panel. Dr. Edwin N. Frankel served as scientific advisor to the research team.

RESULTS BASED ON IOC STANDARDS FOR EXTRA VIRGIN OLIVE OILS

Table 2 and Table 3 show the results based on IOC standards for extra virgin olive oils. Table 2 shows that, of the five top-selling imported “extra virgin” olive oils in the United States, 73 percent of the samples (66 of 90 samples) failed the IOC sensory standards for extra virgin olive oil as analyzed by two IOC-accredited sensory panels. The July 2010 UC Davis study found the same failure rate of 73 percent for these five top-selling brands (11 of 15 samples). The UC Davis and Australian sensory panels found that each of the failed samples contained sensory defects of greater than zero, particularly the defect of rancidity, which is caused by oxidation (which can occur before or after bottling), and fustiness, which is caused from olives allowed to undergo an advanced state of fermentation prior to processing. Table

⁸ Information Resources, Inc., October 1, 2009

2 shows that the failure rate for the top-selling brands ranged from a high of 94 percent to a low of 56 percent depending on the brand. Sensory defects are indicators that these samples were oxidized, of poor quality, and/or adulterated with cheaper refined oils. None of the Australian and California samples failed both sensory panels, while 11 percent of the top-selling premium Italian brand samples failed the two panels. Table 3 shows that all of the oil samples passed the IOC chemistry standards for free fatty acids (FFA), fatty acid profile (FAP) and peroxide value (PV), but several of the samples failed the ultraviolet absorption (UV) tests.

Table 2. Both sensory panels find that top-selling brands usually fail IOC extra virgin standards

	BRAND	\$/OZ	# SAMPLES	# FAILING BOTH SENSORY PANELS	% FAILING BOTH SENSORY PANELS
TOP-SELLING BRANDS	California Olive Ranch	0.46	18	0	0
	Cobram Estate	0.42	8	0	0
	Lucini	0.89	18	2	11
	Colavita	0.61	18	10	56
	Star	0.39	18	11	61
	Bertolli	0.47	18	13	72
	Filippo Berio	0.47	18	15	83
	Pompeian	0.39	18	17	94
	Avg, Top-Selling Brands	0.47	18	13	73

Table 3. IOC chemical tests show low failure rates for most brands

	BRAND	\$/OZ	# SAMPLES	% FAILING FFA	% FAILING PV	% FAILING FAP	% FAILING UV K232	% FAILING UV K268	% FAILING UV ΔK
TOP-SELLING BRANDS	California Olive Ranch	0.46	18	0	0	0	0	0	0
	Cobram Estate	0.42	8	0	0	0	0	0	0
	Lucini	0.89	18	0	0	0	0	11	0
	Star	0.39	18	0	0	0	0	0	0
	Bertolli	0.47	18	0	0	0	11	0	0
	Colavita	0.61	18	0	0	0	0	39	0
	Filippo Beria	0.47	18	0	0	0	6	39	0
	Pompeian	0.39	18	0	0	0	33	61	22
	Avg, Top-Selling Brands	0.47	18	0	0	0	10	28	4

RESULTS BASED ON GERMAN/AUSTRALIAN STANDARDS FOR EXTRA VIRGIN OLIVE OILS

A low level of DAGs indicates that a sample is hydrolyzed, oxidized, of poor quality, and/or adulterated with cheaper refined oils, while an elevated level of PPP indicates that a sample is oxidized and/or adulterated with cheaper refined

ails. With time and possibly accelerated with the application of heat, the levels of PPP increase, but with enough time and oxidation levels of PPP disappear and cannot be detected. Table 4 on page 7 indicates that 70 percent of the samples from the five top-selling imported brands failed the DAGs test and 50 percent failed the PPP test. All of the 18 samples of the California brand passed the DAGs test and 89 percent of the samples passed the PPP test. The Italian premium brand failed the DAGs and PPP tests in about one-third of the samples. The Australian brand passed the DAGs test in all cases and failed the PPP test in all cases.

Table 4. German/Australian chemical tests show significant failure rates

	BRAND	S/OZ	# SAMPLES	% FAILING DAGs	% FAILING PPP
TOP-SELLING BRANDS	California Olive Ranch	0.46	18	0	11
	Lucini	0.89	18	33	28
	Cabram Estate	0.42	8	0	100
	Filippo Berio	0.47	18	33	17
	Bertalli	0.47	18	61	50
	Colavita	0.61	18	78	39
	Star	0.39	18	78	50
	Pompeian	0.39	18	100	94
	Avg, Tap-Selling Brands	0.47	18	70	50

RELATIONSHIP BETWEEN SENSORY AND CHEMISTRY ANALYSIS

The relationship between the samples that failed the IOC sensory standard for both sensory panels and also failed chemical tests is examined in Table 5 below. Table 5 shows, for example, that of the two Lucini samples that failed both

Table 5. German/Australian chemical tests confirm failed sensory samples more frequently than IOC tests

			PERCENTAGE OF SAMPLES FAILING BOTH SENSORY PANELS THAT WERE CONFIRMED BY CHEMICAL TESTS							
			IOC TESTS						GERMAN/AUST TESTS	
BRAND		# OF SAMPLES FAILING BOTH SENSORY PANELS	FFA	FAP	PV	UV K232	UV K268	UV ΔK	DAGs	PPP
TOP-SELLING BRANDS	Calafnia Olive Ranch	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Cabram Estate	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lucini	2	0	0	0	0	100	0	0	0
	Filippo Berio	15	0	0	0	7	33	0	33	20
	Star	11	0	0	0	0	0	0	64	27
	Bertolli	13	0	0	0	8	0	0	62	46
	Colavita	10	0	0	0	0	50	0	70	50
	Pompeian	17	0	0	0	35	65	24	100	94
	Average, All Brands	68 (total)	0	0	0	12	34	6	65	49

sensory panels, 100 percent of those two samples failed the UV K268 test, and that none of the other chemical tests confirmed the negative sensory result for the two Lucini samples. Table 5 shows that the strongest relationship between chemical analysis and negative sensory results was found in the DAGs test (65 percent), in other words, of the 68 samples that failed both sensory panel tests, 65 percent of those samples also failed the DAGs test. The PPP test had the next highest confirmation rate (49 percent), followed by K268 (34 percent), K232 (12 percent) and ΔK (6 percent). The FFA, FAP and PV tests were not useful in confirming negative sensory results. These results are consistent with the results from the July 2010 UC Davis study, in which the DAGs test had the highest confirmation rate at 83 percent, followed by the PPP test at 50 percent, followed by the UV K232 test at 30 percent, UV K268 test at 3 percent, and FFA at 3 percent. In the July 2010 study the IOC standards for FAP, PV, and ΔK tests were not useful in confirming negative sensory results.

CONCLUSIONS

Our laboratory tests found that the top-selling imported brands of “extra virgin” olive oil sold in the United States and purchased at retail locations throughout California often failed the IOC’s sensory standards for extra virgin olive oil. Sensory analysis showed that these failed samples had objectionable descriptors such as rancid and fusty. Sensory analysis is a sensitive tool to analyze olive oil quality and is an essential component of the IOC olive oil standards, but sensory analysis should be supported by gas chromatographic analyses and other analytical methods. It is essential to support sensory evaluations by chemical tests for volatile compounds that are known to be produced by lipid oxidation.

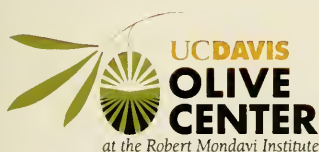
Our chemical tests indicate that the samples usually pass the IOC’s chemical tests even when those samples failed two IOC-accredited sensory panels. Chemical confirmation of the negative sensory results were strongest with the German/Australian DAGs and PPP tests, followed by IOC tests for UV absorption. The IOC and USDA standards would be more effective in assessing and enforcing olive oil quality by including the German/Australian DAGs and PPP standards.

Our testing indicated that the samples failed extra virgin olive oil standards for reasons that include one or more of the following: (a) oxidation by exposure to elevated temperatures, light, and/or aging; (b) adulteration with cheaper refined olive oil; and (c) poor quality oil made from damaged and overripe olives, processing flaws, and/or improper oil storage.

RECOMMENDATIONS FOR FUTURE RESEARCH

We recommend pursuing further research on the following topics:

- **Investigate chemical markers for sensory defects.** Determine key volatile flavor compounds by gas chromatographic analyses to obtain more direct evidence for oxidation or other sources of flavor deterioration.
- **Determine the effects of minor constituents on oxidative stability and flavor deterioration.** Develop methods to evaluate traces of chlorophylls, metal impurities and minor constituents known to affect the oxidative stability of polyunsaturated vegetable oils.
- **Establish chemical profiles of California olive oils.** Evaluate the olive oils for major chemical constituents in a range of climates, elevations and varieties.



The UC Davis Olive Center is the only academic center of its kind in North America, a leader in education and research on olive growing and processing. Learn more at www.olivecenter.ucdavis.edu and on facebook.

Appendix: Evaluation of Extra-Virgin Olive Oil Sold in California

CONTENTS

SAMPLE INFORMATION	 A2
SENSORY DATA FROM AUSTRALIAN OILS RESEARCH LABOATORY AND UC DAVIS PANELS	
• Samples that Failed Both Panels	 A7
CHEMISTRY LABORATORY DATA FROM AUSTRALIAN OILS RESEARCH LABOATORY	
• Samples that Failed UV Absorbance	 A9
• Samples that Failed Pyropheophytins (PPP) and/or 1,2-Diacylglycerols (DAGs)	 A10

Sample Information

	Sample #	Type of Bottle	Use by Date	Purchased Store	Lot Numbers	Cost \$/ounce
Filippo Berio	1	Plastic, clear	10/1/2011	Walmart 1A	LE24BE	0.36
	2	Plastic, clear	2/2/2012	Walmart 2A	LE22FE	0.36
	3	Glass, clear	12/2/2011	Save Mart 1A	LE02DE	0.47
	4	Glass, clear	10/4/2011	Save Mart 2A	LE09BE	0.47
	5	Glass, clear	10/1/2011	Safeway 1A	LE09BE	0.57
	6	Glass, clear	7/2/2011	Safeway 2A	LE04MD	0.57
	7	Plastic, clear	10/1/2011	Walmart 1B	LE24BE	0.36
	8	Plastic, clear	2/1/2011	Walmart 2B	LE15FD01	0.36
	9	Glass, clear	9/8/2011	Lucky 1B	LE11AE	0.47
	10	Glass, clear	12/2/2011	Lucky 2B	LE02DE	0.47
	11	Glass, clear	2/2/2012	Safeway 1B	LE25FE	0.57
	12	Glass, clear	7/2/2011	Safeway 2B	LE04MD	0.57
	13	Plastic, clear	10/1/2011	Walmart 1C	LE24BE	0.37
	14	Plastic, clear	10/1/2011	Walmart 2C	LE24BE	0.37
	15	Glass, clear	10/1/2011	Ralphs 1C	LE09BE	0.53
	16	Glass, clear	10/4/2011	Ralphs 2C	LE09BE	0.53
	17	Glass, clear	10/3/2011	Vons 1C	LE09BE	0.53
	18	Glass, clear	9/4/2011	Vons 2C	LE11AE	0.53
Bertolli	1	Glass, clear	10/31/2011	Walmart 1A	L0420T H1252	0.37
	2	Glass, clear	9/30/2011	Walmart 2A	L0515R H1035	0.37
	3	Glass, clear	9/30/2011	Foods Co 1A	L0217T H1209	0.50
	4	Glass, clear	9/30/2011	Foods Co 2A	L0217T H1557	0.50
	5	Glass, clear	9/30/2011	Safeway 1A	L0217T H1542	0.58
	6	Glass, clear	9/30/2011	Safeway 2A	L0117T H1238	0.58
	7	Glass, clear	9/30/2011	Walmart 1B	L0515R H1042	0.37
	8	Glass, clear	10/31/2011	Walmart 2B	L0420T H1252	0.37
	9	Glass, clear	10/31/2011	Foods Co 1B	L0520T H2251	0.47
	10	Glass, clear	9/30/2011	Foods Co 2B	L0217T H1557	0.47
	11	Glass, clear	9/30/2011	Safeway 1B	L0117T H1220	0.58
	12	Glass, clear	9/30/2011	Safeway 2B	L0117T H0649	0.58
	13	Glass, clear	11/30/2011	Walmart 1C	L0126T H0644 I.G.R.E.TU	0.37
	14	Glass, clear	10/31/2011	Walmart 2C	L0420T H0020	0.37
	15	Glass, clear	11/30/2011	Ralphs 1C	L0525T H1611 I.G.R.E.TU	0.45
	16	Glass, clear	11/30/2011	Ralphs 2C	L0525T H1611 I.G.R.E.TU	0.45
	17	Glass, clear	6/30/2011	Vons 1C	L0305R H1904	0.53
	18	Glass, clear	6/30/2011	Vons 2C	L0305R H1904	0.53

Appendix: Evaluation of Extra-Virgin Olive Oil Sold in California

Pompeian	1	Plastic, clear	12/30/2011	Walmart 1A	91230259	0.32
	2	Plastic, clear	1/4/2012	Walmart 2A	100104262	0.32
	3	Glass, clear	6/24/2012	Foods Co 1A	100624625	0.41
	4	Glass, clear	6/24/2012	Foods Co 2A	100624625	0.41
	5	Plastic, clear	6/9/2012	Save Mart 1A	100609611	0.41
	6	Plastic, clear	6/9/2012	Save Mart 2A	100609611	0.41
	7	Plastic, clear	1/12/2012	Walmart 1B	100112284	0.32
	8	Plastic, clear	1/20/2012	Walmart 2B	100120301	0.32
	9	Glass, clear	1/27/2012	Foods Co 1B	100127319	0.41
	10	Glass, clear	6/24/2012	Foods Co 2B	100624622	0.41
	11	Plastic, clear	6/9/2012	Lucky 1B	100609611	0.41
	12	Plastic, clear	6/9/2012	Lucky 2B	100609611	0.41
	13	Plastic, clear	3/23/2012	Walmart 1C	100323444	0.33
	14	Plastic, clear	3/17/2012	Walmart 2C	100317422	0.33
	15	Plastic, clear	7/2/2012	Ralphs 1C	100702635	0.41
	16	Plastic, clear	7/2/2012	Ralphs 2C	100702635	0.41
	17	Plastic, clear	9/12/2011	Vons 1C	90912301	0.48
	18	Plastic, clear	8/11/2011	Vons 2C	90811211	0.48
Colavita	1	Glass, clear	4/1/2012	Walmart 1A	L10113 10:34	0.47
	2	Glass, clear	2/1/2012	Walmart 2A	L10056 10:19	0.47
	3	Glass, clear	n/a	Save Mart 1A	L09204 10:58	0.70
	4	Glass, clear	n/a	Save Mart 2A	L09204 16:13	0.70
	5	Glass, clear	2/1/2012	Raleys 1A	L10036 10:06	0.70
	6	Glass, clear	3/1/2012	Raleys 2A	L10075 14:21	0.70
	7	Glass, clear	5/1/2012	Walmart 1B	L10131 09:22	0.47
	8	Glass, clear	n/a	Walmart 2B	L09357V63	0.59
	9	Glass, clear	4/1/2012	Lucky 1B	L10112 12:08	0.70
	10	Glass, clear	2/1/2012	Lucky 2B	L10036 10:46	0.70
	11	Glass, clear	n/a	Raleys 1B	L10008 11:55	0.70
	12	Glass, clear	8/1/2012	Raleys 2B	L10217 14:13	0.51
	13	Glass, clear	4/1/2012	Walmart 1C	L10097 09:13	0.46
	14	Glass, clear	n/a	Walmart 2C	L09363 16:21	0.46
	15	Glass, clear	2/1/2012	Albertsons 1C	L10047 14:42	0.58
	16	Glass, clear	4/1/2012	Albertsons 2C	L10105 11:06	0.67
	17	Glass, clear	3/1/2012	Ralphs 1C	L10076 13:02	0.70
	18	Glass, clear	3/1/2012	Ralphs 2C	L10076 13:02	0.70
Star	1	Glass, clear	12/5/2011	Walmart 1A	109819-05/12	0.36
	2	Glass, clear	1/7/2012	Walmart 2A	110489-07/01	0.36
	3	Glass, clear	7/9/2012	Foods Co 1A	105160-09/07	0.34
	4	Glass, clear	7/9/2012	Foods Co 2A	105160-09/07	0.34
	5	Glass, clear	5/5/2012	Safeway 1A	103360-05/05	0.53
	6	Glass, clear	4/14/2012	Safeway 2A	102860-14/04	0.53

Appendix: Evaluation of Extra-Virgin Olive Oil Sold in California

Star (Continued)	7	Glass, clear	1/7/2012	Walmart 1B	110489-07/01	0.36
	8	Glass, clear	1/7/2012	Walmart 2B	110489-07/01	0.36
	9	Glass, clear	6/8/2012	Foods Co 1B	103930-08/06	0.39
	10	Glass, clear	7/9/2012	Foods Co 2B	105160-09/07	0.39
	11	Glass, clear	3/22/2012	Safeway 1B	102240-22/03	0.30
	12	Glass, clear	3/22/2012	Safeway 2B	102240-22/03	0.30
	13	Glass, clear	1/30/2012	Walmart 1C	100630-30/01	0.37
	14	Glass, clear	1/30/2012	Walmart 2C	100630-30/01	0.37
	15	Glass, clear	6/29/2012	Ralphs 1C	104730-29/06	0.53
	16	Glass, clear	7/9/2012	Ralphs 2C	105160-09/07	0.53
	17	Glass, clear	3/22/2012	Vons 1C	102240-22/03	0.35
	18	Glass, clear	3/22/2012	Vons 2C	102240-22/03	0.35
California Olive Ranch	1	Glass, green	6/1/2012	Walmart 1A	DW18119	0.50
	2	Glass, green	8/1/2012	Walmart 2A	DW21710	0.50
	3	Glass, green	9/1/2012	Save Mart 1A	101029	1.06
	4	Glass, green	7/1/2012	Save Mart 2A	DW20810	1.06
	5	Glass, green	7/1/2012	Raleys 1A	DW20710	0.98
	6	Glass, green	7/1/2012	Raleys 2A	DW20710	0.98
	7	Glass, green	6/1/2012	Walmart 1B	DW18110	0.40
	8	Glass, green	6/1/2012	Walmart 2B	DW18110	0.38
	9	Glass, green	5/1/2012	Lucky 1B	DW130100858	0.53
	10	Glass, green	5/1/2012	Lucky 2B	DW130100829	0.53
	11	Glass, green	7/1/2012	Raleys 1B	DW20710	0.52
	12	Glass, green	7/1/2012	Raleys 2B	DW20710	0.52
	13	Glass, green	7/1/2012	Walmart 1C	DW20810	0.37
	14	Glass, green	5/1/2012	Walmart 2C	DW131101357	0.38
	15	Glass, green	5/1/2012	Albertsons 1C	DW130100720	0.53
	16	Glass, green	5/1/2012	Albertsons 2C	DW131100850	0.53
	17	Glass, green	9/1/2012	Ralphs 1C	DW26010	0.51
	18	Glass, green	7/1/2012	Ralphs 2C	DW20710	0.51
Lucini	1	Glass, clear	n/a	Walmart 1A	C 198 209	0.49
	2	Glass, clear	n/a	Walmart 2A	C 198 209	0.49
	3	Glass, clear	n/a	Raleys 1A	C 198 229	1.18
	4	Glass, clear	n/a	Raleys 2A	C 209 067	1.18
	5	Glass, clear	n/a	Safeway 1A	C 199 350	1.03
	6	Glass, clear	n/a	Safeway 2A	C 209 067	1.03
	7	Glass, clear	n/a	Walmart 1B	C 209 081	0.53
	8	Glass, clear	n/a	Walmart 2B	C 198 320	0.53
	9	Glass, clear	n/a	Raleys 1B	C 209 067	1.18
	10	Glass, clear	n/a	Raleys 2B	C 209 067	1.18
	11	Glass, clear	n/a	Safeway 1B	C 209 046	1.15
	12	Glass, clear	n/a	Safeway 2B	C 209 067	1.03

Appendix: Evaluation of Extra-Virgin Olive Oil Sold in California

Lucini (Continued)	13	Glass, clear	n/a	Walmart 1C	C 198 230	0.50
	14	Glass, clear	n/a	Walmart 2C	C 209 091	0.50
	15	Glass, clear	n/a	Ralphs 1C	C 198 229	1.06
	16	Glass, clear	n/a	Ralphs 2C	C 209 067	1.06
	17	Glass, clear	n/a	Vons 1C	C 209 067	0.98
	18	Glass, clear	n/a	Vons 2C	C 209 067	0.98
Cobram Estate	1	Glass, green	7/24/2011	Save Mart 1A	9205	0.47
	2	Glass, green	7/24/2011	Save Mart 2A	9208	0.47
	3	Glass, green	7/24/2011	Raleys 1A	9208	0.36
	4	Glass, green	7/24/2011	Raleys 2A	9208	0.36
	5	Glass, green	7/24/2011	Lucky 1B	9205	0.47
	6	Glass, green	7/24/2011	Lucky 2B	9208	0.47
	7	Glass, green	7/24/2011	Raleys 1B	9208	0.38
	8	Glass, green	7/24/2011	Raleys 2B	9208	0.38

Appendix: Evaluation of Extra-Virgin Olive Oil Sold in California

Walmart 1A: 755 Riverpoint Dr, West Sacramento, CA 95691
Walmart 2A: 5821 Antelope Rd, Sacramento, CA 95842
Foods Co 1A: 3625 Northgate Blvd, Sacramento, CA 95834
Foods Co 2A: 5330 Stockton Blvd, Sacramento, CA 95820
Safeway 1A: 2851 Del Paso Rd, Sacramento, CA 95835
Safeway 2A: 1025 Alhambra Blvd, Sacramento, CA 95816
Save Mart 1A: 3291 Truxel Rd, Sacramento, CA 95833
Save Mart 2A: 2735 Marconi Ave, Sacramento, CA 95821
Raleys 1A: 4650 Natomas Blvd, Sacramento, CA 95835
Raleys 2A: 3518 Marconi Ave, Sacramento, CA 95821
Walmart 1B: 7011 Main St, American Canyon, CA 94503
Walmart 2B: 235 East Dorset Dr, Dixon, CA 95620
Foods Co 1B: 1250 MacDonald Ave, Richmond, CA 94801
Foods Co 2B: 300 Atlantic Ave, Pittsburg, CA 94565
Safeway 1B: 733 S. Wolfe Rd, Sunnyvale, CA 96086
Safeway 2B: 785 East El Camino Real, Sunnyvale, CA 94807
Lucky 1B: 3705 El Camino Real, Santa Clara, CA 95051
Lucky 2B: 1740 Tuolumne St, Vallejo, CA 94589
Raleys 1B: 4300 Sonoma Blvd, Vallejo, CA 94589
Raleys 2B: 3360 San Pablo Dam Rd, El Sobrante, CA 94803
Walmart 1C: 8500 Washington Blvd, Pico Rivera, CA 90660
Walmart 2C: 26471 Carl Boyer Dr, Santa Clarita, CA 91350
Ralphs 1C: 1100 N San Fernando Blvd, Burbank, CA 91504
Ralphs 2C: 25 E Alameda Ave, Burbank, CA 91502
Vons 1C: 561 N Glendale Ave, Glendale, CA 91206
Vons 2C: 311 W Los Feliz Rd, Glendale, CA 91204
Albersons 1C: 1000 S Central Ave, Glendale, CA 91204
Albersons 2C 2035 Hillhurst Ave, Los Angeles, CA 90027

Samples that Failed both Australian Oils Research Laboratory and UC Davis Panels

	Sample #
Filippo Berio	1
	3
	4
	5
	6
	7
	8
	9
	10
	11
	12
	13
	15
	17
	18
Bertolli	1
	2
	3
	5
	6
	7
	8
	9
	10
	12
	13
	15
	18
Pompeian	1
	2
	3
	4
	5
	6
	7
	8

Appendix: Evaluation of Extra-Virgin Olive Oil Sold in California

Pompeian (Continued)	9
	11
	12
	13
	14
	15
	16
	17
	18
Colavita	1
	3
	4
	5
	6
	7
	9
	10
	14
Star	17
	18
	1
	3
	4
	5
	6
	9
	10
	11
	15
Lucini	16
	18
	3
	8

Samples that Failed UV Absorbance

	Sample #	UV absorbance ($K^{1\%}_{1cm}$)		
		K232	K268	ΔK
Filippo Berio	1	2.33	<u>0.23</u>	0.005
	2	2.18	<u>0.26</u>	0.009
	7	2.32	<u>0.23</u>	0.006
	8	<u>2.52</u>	<u>0.25</u>	0.007
	10	2.23	<u>0.23</u>	0.007
	11	2.09	<u>0.27</u>	0.010
	14	2.33	<u>0.25</u>	0.007
Bertolli	17	<u>2.58</u>	0.18	<0.003
	18	<u>2.57</u>	0.20	<0.003
Pompeian	1	<u>2.54</u>	<u>0.26</u>	0.009
	2	<u>2.64</u>	<u>0.25</u>	0.008
	5	2.40	<u>0.23</u>	0.006
	6	2.43	<u>0.23</u>	0.006
	7	2.49	<u>0.33</u>	<u>0.013</u>
	8	<u>2.55</u>	<u>0.37</u>	<u>0.015</u>
	9	<u>2.62</u>	0.22	0.005
	11	2.39	<u>0.25</u>	0.010
	13	2.43	<u>0.32</u>	<u>0.013</u>
	14	2.34	<u>0.28</u>	<u>0.011</u>
	17	<u>2.57</u>	<u>0.26</u>	0.008
	18	<u>2.80</u>	<u>0.29</u>	0.010
Colavita	3	2.46	<u>0.26</u>	0.009
	4	2.50	<u>0.26</u>	0.009
	5	2.20	<u>0.24</u>	0.010
	8	2.13	<u>0.24</u>	0.008
	9	2.25	<u>0.23</u>	0.008
	10	2.39	<u>0.24</u>	0.010
	11	1.99	<u>0.23</u>	0.010
Lucini	3	2.37	<u>0.26</u>	0.010
	8	2.31	<u>0.24</u>	0.008

Samples that Failed Pyropheophytins (PPP) and/or 1,2-Diacylglycerols (DAGs)

	Sample #	PPP (% of total pheophytins)	DAGs (% of 1,2-DAGs to total 1,2 & 1,3 DAGs)
Filippo Berio	2	12.6	<u>39.9</u>
	3	11.1	<u>35.7</u>
	6	<u>19.3</u>	<u>26.6</u>
	8	<u>23.1</u>	<u>31.6</u>
	10	11.8	<u>35.9</u>
	12	<u>19.5</u>	<u>27.2</u>
Bertolli	1	<u>18.0</u>	<u>30.9</u>
	2	14.5	<u>33.9</u>
	7	<u>16.7</u>	<u>33.2</u>
	8	<u>20.6</u>	<u>31.8</u>
	9	14.7	<u>35.4</u>
	13	<u>26.9</u>	<u>30.4</u>
	14	<u>16.5</u>	<u>32.9</u>
	15	<u>21.7</u>	<u>31.4</u>
	16	<u>21.5</u>	<u>31.9</u>
	17	<u>18.9</u>	<u>30.0</u>
	18	<u>19.1</u>	<u>31.2</u>
Pompeian	1	<u>21.2</u>	<u>26.9</u>
	2	<u>20.6</u>	<u>26.6</u>
	3	<u>24.0</u>	<u>30.2</u>
	4	<u>24.0</u>	<u>29.9</u>
	5	<u>22.6</u>	<u>29.5</u>
	6	<u>22.3</u>	<u>30.2</u>
	7	<u>22.0</u>	<u>27.2</u>
	8	<u>20.8</u>	<u>27.0</u>
	9	<u>18.6</u>	<u>28.2</u>
	10	<u>25.3</u>	<u>29.5</u>
	11	<u>21.5</u>	<u>30.3</u>
	12	<u>21.3</u>	<u>30.7</u>
	13	14.9	<u>30.5</u>
	14	<u>17.5</u>	<u>33.2</u>
	15	<u>26.0</u>	<u>30.0</u>
	16	<u>25.9</u>	<u>30.3</u>
	17	<u>18.0</u>	<u>29.2</u>
	18	<u>17.2</u>	<u>28.3</u>
Colavita	1	10.5	<u>35.0</u>

Appendix: Evaluation of Extra-Virgin Olive Oil Sold in California

Colavita (Continued)	2	12.4	36.2
	3	Not Detected	29.6
	4	Not Detected	29.9
	5	Not Detected	44.8
	6	12.2	33.0
	7	11.1	31.9
	8	Not Detected	49.7
	9	Not Detected	35.4
	10	16.2	44.3
	11	Not Detected	36.8
	12	10.2	35.4
	13	11.9	35.1
	15	8.8	37.9
	16	11.1	34.9
	17	9.7	34.3
	18	9.7	34.5
Star	1	21.6	27.6
	2	20.8	27.8
	3	11.8	39.6
	5	12.7	39.0
	6	11.4	38.0
	7	28.6	27.5
	8	38.4	27.4
	9	14.8	36.1
	11	16.4	33.2
	12	16.4	33.9
	13	32.2	28.3
	14	33.2	27.9
	17	13.8	33.6
	18	16.7	33.7
California Olive Ranch	7	21.7	65.5
	16	32.2	65.0
Lucini	1	20.4	34.0
	2	16.9	39.4
	3	Not Detected	35.9
	8	42.3	33.9
	13	10.9	34.3
	15	17.9	39.1
Cobram Estate	1	19.9	49.9
	2	19.4	64.5
	3	18.6	50.4
	4	19.4	51.2

Appendix: Evaluation of Extra-Virgin Olive Oil Sold in California

Cobram Estate (Continued)	5	<u>24.9</u>	48.6
	6	<u>16.4</u>	58.9
	7	<u>18.0</u>	50.7
	8	<u>19.0</u>	48.6

LEGISLATION

SB 818 – CHAPTER 567

STATUTES OF 2011

~

SENATE FLOOR

ANALYSIS

Senate Bill No. 818

CHAPTER 567

An act to amend Sections 112875, 112876, 112891, and 112895 of, to amend and repeal Section 112877 of, and to add Sections 112876.5, 112880, and 112894 to, the Health and Safety Code, and to amend Section 1 of Chapter 694 of the Statutes of 2008, relating to food.

[Approved by Governor October 7, 2011. Filed with
Secretary of State October 7, 2011.]

LEGISLATIVE COUNSEL'S DIGEST

SB 818, Wolk. Food labeling: olive oil.

Existing law requires the State Department of Public Health to enforce various provisions of existing law regarding the manufacture, blending, production, and sale of olive oil. Existing law makes the violation of these provisions a crime. Existing law defines olive oil to mean the edible oil obtained solely from the fruit of the olive tree to the exclusion of oils obtained using solvents or reesterification processes and of any mixture with oils derived of other kinds except in the making of flavored olive oil. Existing law also defines olive oil grades and provides that olive oil grades are to be in a specified order.

This bill would revise the definitions of olive oil and grades of olive oil and olive-pomace oil, as specified. It would require lampante virgin olive oil and crude olive-pomace oil to be refined before consumption. By changing the definition of a crime, this bill would impose a state-mandated local program.

The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

The people of the State of California do enact as follows:

SECTION 1. Section 112875 of the Health and Safety Code is amended to read:

112875. "Olive oil," as used in this chapter means the edible oil obtained solely from the fruit of the olive tree (*Olea europea* L.) to the exclusion of oils obtained using solvents or reesterification processes and of any mixture with oils of other kinds except in the making of flavored olive oil, as defined in Section 112878.

SEC. 2. Section 112876 of the Health and Safety Code is amended to read:

112876. The hierarchy for virgin olive oil grades shall be, from highest to lowest, extra-virgin olive oil, virgin olive oil, and virgin olive oil not fit for human consumption, sometimes known as lampante virgin olive oil, which shall be the lowest level of quality among the virgin olive oils. In terms of hierarchy, olive oil and refined olive oil shall fall below the virgin olive oil category. Olive oil grades shall be in the following categories:

- (a) Virgin olive oils.
 - (1) Extra virgin olive oil.
 - (2) Virgin olive oil.
 - (3) Virgin olive oil not fit for human consumption without further processing, sometimes known as lampante virgin olive oil.
- (b) Olive oil.
- (c) Refined olive oil.

SEC. 3. Section 112876.5 is added to the Health and Safety Code, to read:

112876.5. The hierarchy for olive-pomace oil grades shall be, from highest to lowest, olive-pomace oil, refined olive-pomace oil, and crude olive-pomace oil, which is the lowest level of quality among the olive-pomace oils. Olive-pomace oil grades shall be in the following categories:

- (a) Olive-pomace oil.
 - (b) Refined olive-pomace oil.
 - (c) Crude olive-pomace oil.
- SEC. 4. Section 112877 of the Health and Safety Code, as amended by Section 120 of Chapter 140 of the Statutes of 2009, is repealed.
- SEC. 5. Section 112877 of the Health and Safety Code, as amended by Section 121 of Chapter 140 of the Statutes of 2009, is amended to read:

112877. Olive oil grades are defined as follows:

(a) “Virgin olive oils” are the oils obtained from the fruit of the olive tree solely by mechanical or other physical means under conditions, including thermal conditions, that do not lead to alterations in the oil, and that have not undergone any treatment other than washing, decanting, centrifuging, and filtration. Virgin olive oils without further processing include:

(1) “Extra virgin olive oil” is virgin olive oil that has excellent flavor and odor expressed as a median of defects equal to zero and a median of fruitiness greater than zero, has a free fatty acid content, expressed as oleic acid, of not more than 0.8 grams per 100 grams oil, has a peroxide value of not more than 20 milliequivalent peroxide oxygen per kilogram oil and meets the additional requirements for “United States Extra Virgin Olive Oil” outlined in the United States Standards for Grades of Olive Oil and Olive-Pomace Oil published in the Federal Register that are in effect on October 25, 2010.

(2) “Virgin olive oil” is virgin olive oil that has reasonably good flavor and odor expressed as a median of defects between zero and 2.5 and a median of fruitiness greater than zero, has a free fatty acid content, expressed as

oleic acid, of not more than 2 grams per 100 grams oil, has a peroxide value of not more than 20 milliequivalent peroxide oxygen per kilogram oil, and meets the additional requirements for “United States Virgin Olive Oil” outlined in the United States Standards for Grades of Olive Oil and Olive-Pomace Oil published in the Federal Register that are in effect on October 25, 2010.

(3) “Virgin olive oil not fit for human consumption without further processing,” sometimes known as “lampante virgin olive oil,” is virgin olive oil which has poor flavor and odor expressed as a median of defects between 2.5 and 6.0 or when the median of defects is less than or equal to 2.5 and the median of fruitiness is zero, has a free fatty acid content, expressed as oleic acid, of more than 2 grams per 100 grams, and meets the additional requirements of the “United States Virgin Olive Oil Not Fit For Human Consumption Without Further Processing” as outlined in the United States Standards for Grades of Olive Oil and Olive-Pomace Oil published in the Federal Register that are in effect on October 25, 2010. This grade of olive oil is intended for refining or for purposes other than food use.

(b) “Olive oil” is the oil consisting of a blend of refined olive oil and virgin olive oils fit for consumption without further processing. It has a free fatty acid content, expressed as oleic acid, of not more than 1 gram per 100 grams oil and meets the additional requirements for “United States Olive Oil” described in the United States Standards for Grades of Olive Oil and Olive-Pomace Oil published in the Federal Register that are in effect on October 25, 2010.

(c) “Refined olive oil” is the olive oil obtained from virgin olive oils by refining methods that do not lead to alterations in the initial glyceridic structure (basic glycerin-fatty acid content). It has a free fatty acid content, expressed as oleic acid, of not more than 0.3 grams per 100 grams oil, and meets the additional requirements for “United States Refined Olive Oil” described in the United States Standards for Grades of Olive Oil and Olive-Pomace Oil published in the Federal Register that are in effect on October 25, 2010.

(d) “Olive-pomace oil” is oil obtained by treating olive pomace, which is the product that remains after the mechanical extraction of olive oil, with solvents or other physical treatments, to the exclusion of oils obtained by synthetic processes and a mixture with oils of other kinds. Olive-pomace oils shall be labeled and marketed with the following designations and definitions:

(1) “Olive-pomace oil” is the oil comprising the blend of refined olive-pomace oil and virgin olive oils fit for consumption without further processing. It has a free fatty acid content, expressed as oleic acid, of not more than 1 gram per 100 grams oil, and meets the additional requirements for “United States Olive-Pomace Oil” outlined in the United States Standards for Grades of Olive Oil and Olive-Pomace Oil published in the Federal Register that are in effect on October 25, 2010.

(2) “Refined olive-pomace oil” is the oil obtained from crude olive-pomace oil by refining methods that do not lead to alterations in the

initial glyceridic structure. It has a free fatty acid content, expressed as oleic acid, of not more than 0.3 grams per 100 grams oil, and meets the additional requirements for “United States Refined Olive-Pomace Oil” outlined in the United States Standards for Grades of Olive Oil and Olive-Pomace Oil published in the Federal Register that are in effect on October 25, 2010.

(3) “Crude olive-pomace oil” is olive-pomace oil that is intended for refining for use for human consumption or that is intended for technical use and that meets the requirements for “United States Crude Olive-Pomace Oil” outlined in the United States Standards for Grades of Olive Oil and Olive-Pomace Oil published in the Federal Register that are in effect on October 25, 2010.

SEC. 6. Section 112880 is added to the Health and Safety Code, to read: 112880. For purposes this chapter, the following definitions shall apply:

(a) “Median of defects” means a calculation of the median score from a panel of tasters that characterizes the negative flavor and odor attributes of virgin olive oil, such as, but not limited to, musty, fusty, winey-vinegary, muddy-sediment, and rancid.

(b) “Median of fruitiness” means a calculation of the median score from a panel of tasters that characterizes virgin olive oil produced from olives, such as, but not limited to, olive, apple, green, sweet, grass, nutty, and tomato.

(c) “Panel of tasters” means the method of analyzing organoleptic characteristics of virgin olive oil, as defined in the United States Standards for Grades of Olive Oil and Olive-Pomace Oil published in the Federal Register that are in effect on October 25, 2010.

SEC. 7. Section 112891 of the Health and Safety Code is amended to read:

112891. Any olive oil and olive-pomace oil labeled for sale shall be consistent with this chapter.

SEC. 8. Section 112894 is added to the Health and Safety Code, to read:

112894. Virgin olive oil not fit for human consumption, sometimes known as lampante virgin olive oil, shall be refined before consumption.

SEC. 9. Section 112895 of the Health and Safety Code is amended to read:

112895. (a) It is unlawful to manufacture, sell, offer for sale, give away, or to possess imitation olive oil in California.

(b) This section does not prohibit the blending of olive oil with other edible oils, if the blend is not labeled as olive oil or imitation olive oil, is clearly labeled as a blended vegetable oil, and if the contents and proportions of the blend are prominently displayed on the container’s label, or if the oil is a flavored olive oil.

(c) Any olive oil produced, processed, sold, offered for sale, given away, or possessed in California, that indicates on its label “California Olive Oil,” or uses words of similar import that indicate that California is the source of the oil, shall be made of oil derived solely from olives grown in California.

(d) Any olive oil produced, processed, sold, offered for sale, given away, or possessed in California, that indicates on its label that it is from an area

that is one of the approved American Viticultural Areas as set forth in Part 9 (commencing with Sec. 9.1) of Title 27 of the Code of Federal Regulations shall be made of oil 75 percent of which is derived solely from olives grown in that approved American Viticultural Area.

(e) Olive-pomace oil shall not be labeled as olive oil.

SEC. 10. Section 1 of Chapter 694 of the Statutes of 2008 is amended to read:

Section 1. The Legislature hereby finds and declares all of the following:

(a) Extra virgin olive oil has been shown by numerous scientific studies to be associated with fighting cardiovascular disease and providing other health benefits.

(b) California grows and processes more than 99 percent of the extra virgin olive oil produced in the United States, and more than 90 percent of California olive oil meets the international standards for top-grade "extra virgin" as established by the International Olive Council.

(c) The quality of California olive oil is comparable to other producers internationally.

(d) It is the intent of the Legislature that California's definitions of olive oil be consistent with federal standards that have been revised to reflect international standards.

SEC. 11. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.

BILL ANALYSIS

SENATE RULES COMMITTEE	SB 818
Office of Senate Floor Analyses	
1020 N Street, Suite 524	
(916) 445-6614 Fax: (916)	
327-4478	

UNFINISHED BUSINESS

Bill No: SB 818
Author: Wolke (D)
Amended: 6/13/11
Vote: 21

SENATE HEALTH COMMITTEE : 9-0, 4/6/11
AYES: Hernandez, Strickland, Alquist, Anderson, Blakeslee,
De León, DeSaulnier, Rubio, Wolke

SENATE APPROPRIATIONS COMMITTEE : Senate Rule 28.8

SENATE FLOOR : 40-0 (Consent), 5/9/11
AYES: Alquist, Anderson, Berryhill, Blakeslee, Calderon,
Cannella, Corbett, Correa, De León, DeSaulnier, Dutton,
Emmerson, Evans, Fuller, Gaines, Hancock, Harman,
Hernandez, Huff, Kehoe, La Malfa, Leno, Lieu, Liu,
Lowenthal, Negrete McLeod, Padilla, Pavley, Price, Rubio,
Runner, Simitian, Steinberg, Strickland, Vargas, Walters,
Wolke, Wright, Wyland, Yee

ASSEMBLY FLOOR : 78-0, 8/25/11 (Consent) - See last page
for vote

SUBJECT : Food labeling: olive oil

SOURCE : Author

DIGEST : This bill redefines California's olive oil
labeling requirements, making technical yet substantive
changes, to conform to United States labeling standards as
CONTINUED

SB 818

outlined in the U.S. Standards for Grades of Olive Oil and Olive-Pomace oil published in the Federal Register that took effect on October 25, 2010 (federal regulations).

Assembly Amendments add a definition for "panel of tasters."

ANALYSIS :

Existing federal law:

1. Establishes standards, based on international standards, for the various grades of olive oil and olive-pomace oil under the Agricultural Marketing Service (AMS) Division of the United State Department of Agriculture (USDA).
2. Provides definitions for extra virgin olive oil, virgin olive oil, olive oil, refined olive oil and olive-pomace oil, and establishes the hierarchy for virgin olive oil grades.

Existing state law:

1. Requires the Department of Public Health to enforce various provisions of law regarding the manufacture, blending, production, and sale of olive oil.
2. Conforms olive oil definitions, grades and labeling requirements to international standards.
3. Authorizes the addition of vitamin E to specified olive oil.
4. Permits a consumer to re-use a clean olive oil container, can, or drum.
5. Specifies that olive oil labeled as California olive oil must be made from California olives.
6. Permits the blending of olive oil if the contents and proportions of the blend are prominently displayed on the label.

This bill:

CONTINUED

1. Adds a reference to the definition for flavored oil

oils.

2. Restates the hierarchy of virgin olive oil grades to be from highest to lowest and establishes categories of olive oils, both edible and not fit for human consumption, without further processing, rather than quality.
3. Adds the hierarchy for olive-pomace oil grades to be from highest to lowest of quality among olive-pomace oils and establishes that these oil's grades to be in the following categories:

- A. Olive-pomace oil;
- B. Refined olive-pomace oil; and,
- C. Crude olive-pomace oil.

4. Deletes current definitions of olive oil grades.
5. Redefines olive oil grades for each category of oils, making technical yet substantive changes, and referencing the federal regulations. Specific changes for each grade of oils are as follows:
 - A. Adds to the grade of "Virgin olive oil" the terms "without further processing," and changes each of the following definitions as follows:

(1) Deletes "extra virgin oil" reference to certified taste panel or taste panel operated by the University of California or California State University and adds "that has excellent flavor and odor expressed as a median of defects equal to zero and median of fruitiness greater than zero, has a free fatty acid content, and references the federal regulations.

(2) Adds to the "Virgin olive oil" definition the words, "that has reasonably good flavor and odor expressed as a medium of defects between zero and 2.5 and median of fruitiness greater than

CONTINUED

SB 818

Page

4

zero" and adds reference to federal regulations.

(3) Deletes the term "Ordinary virgin olive oil," and replaces it with "Virgin olive oil not fit for human consumption without further processing" and adds "sometimes known as "lampante virgin olive oil," poor flavor and odor expressed

as a median of defects between 2.5 and 6.0, or when the median of defects is less than or equal to 2.5 and the median of fruitiness is zero, and decreases the oleic acid from 3.3 grams to 2.0, and references the federal regulations.

- B. Adds to the "Olive oil" definition the term "without further processing," changes the reference from acidity to fatty acid content and references the federal regulations.
 - C. Adds to the "Refined olive oil" definition a reference for glyceridic structure as "basic glycerin-fatty acid content" and adds reference to federal regulations.
 - D. Adds to the "Olive-pomace oil" category as "the product that remains after the mechanical extraction of olive oil." Redefines each oil definition in this category by replacing "acidity" with "fatty acid" and referencing the federal regulations.
6. Creates, for purposes of this chapter, the following definitions:
- A. "Median of defects" means the flavor and odor of virgin olive oil as the calculation of the median score from a panel of tasters characterizes negative attributes, including but not limited to, musty, fusty, wine-vinegary, muddy-sediment and rancid.
 - B. "Median of fruitiness" means the calculation of the median score from a panel of tasters that characterizes virgin olive oil produced from olives, such as, but not limited to, olive, apple, green, sweet grass, nutty, and tomato.

CONTINUED

SB 818
Page

5

- C. "Panel of tasters" means the method of analyzing organoleptic characteristics of virgin olive oil as defined in federal regulations.
7. Adds "olive-pomace oil" to be labeling requirements that meet these definitions.
8. Requires "virgin olive oil not fit for human consumption, sometimes known as lampante virgin olive oil, to be refined before consumption."
9. Makes it unlawful to label "olive-pomace oil" as olive

oil.

10.Adds the federal regulations reference to the legislative intent.

11.Makes technical, conforming changes.

12.Includes a new crime state mandate disclaimer.

Background

Olive oil

Olive oil is a monounsaturated fat, which has been promoted in recent years as good for the heart and possibly a hedge against developing certain cancers. The Center for Science in the Public Interest has determined that all research suggests that olive oil is the safest and healthiest, or the least damaging to the human system in terms of oil or fat.

Olive oil production in the European Union

The European Union (E.U.) is the world's leading producer of all categories of olive oils, accounting for approximately 80 percent of production, yet they have consumed approximately 70 percent of that production since 1986. Olive oil is produced in Italy, Greece, Spain, Portugal, France, Tunisia, Turkey (an E.U. candidate country), Syria and Morocco. The International Olive Council (IOC) develops standards of quality used by major olive oil producing countries, including Spain, Italy,

CONTINUED

SB 818

Page

6

Greece, Portugal and Turkey. The IOC operates under E.U. established regulations for olive oil, which are consistent with CODEX Alimentarius definitions of the products, which is an internationally used index.

A 2007 New Yorker article reported that in 1997 and 1998, olive oil was the most adulterated agricultural product in the E.U., prompting the E.U.'s anti-fraud office to establish an olive oil task force. The E.U. also began phasing out subsidies for olive oil producers and bottlers in an effort to reduce crime, and after a few years it disbanded the task force. Yet fraud remains a major international problem: olive oil is far more valuable than most other vegetable oils, but it is costly and time-consuming to produce-and surprisingly easy to doctor.

Olive oil production in California

California produces 99 percent of the olive oil in the United States. The olive was first brought to California in the late 1700s by Franciscan padres who journeyed north from San Blas, Mexico. Distributed from San Diego, olive trees were soon in production at all missions along the coast south of San Francisco. As an agricultural product, quality olive oils are in high demand, and the state is home to over 300 artisan olive oil producers, including the largest estate grown olive oil producer in the nation. More than 99.5 percent of commercial olive acreage in California is located in the interior valleys of central California, although olive trees grow throughout the state.

Economic advantages such as suitable soils, water availability, and low land prices have resulted on the current distribution and concentration of olive acreage in the central valley. In the northern Sacramento valley, the counties of Butte, Glenn and Tehama have 33 percent of the state acreage, and in the southern San Joaquin Valley, the counties of Fresno, Kern, Madera and Tulare have 62 percent of the acreage.

Unlike wine, virgin olive oil does not need to be aged to create complexity. The faster the fruit is crushed, the fresher the product will be due to the esterification reaction that occurs over time between free alcohols and free fatty acids. According to the California Olive Oil

CONTINUED

SB 818

Page

7

Council, California olive oil producers are able to bring their fresh product to market sooner than international counterparts, while most imported olive oils can arrive months, sometimes even years, after they are pressed.

Olive oil standards

Voluntary U.S. grade standards are issued under the authority of the Agricultural Marketing Act of 1946, which provides for the development of official U.S. grades to designate different levels of quality. The standards are designed to facilitate orderly marketing by providing a convenient basis for buying and selling, establishing quality control programs and determining loans. The standards also serve as a basis for the inspection and grading of commodities by the Federal inspection service to approve the designation of U.S. grades.

Effective October 24, 2010, the U.S. established new standards for grades of olive oil and olive-pomace oil under the AMS Division of the USDA. This is a revision of the U.S. standards that have been in place since 1948.

According to the USDA, these revised standards will provide a common language for trade and provide consumers more assurance of the quality of olive oil they purchase. This revision could potentially affect more than 500 domestic olive oil producers and growers. In 2008, U.S. production was 500,000 gallons (about 3.8 million pounds). Domestic olive oil consumption is roughly 454 million pounds per year, mostly imported.

The new U.S. standards are almost identical to the requirements of the IOC Trade Standard, with a slight difference in regard to the natural chemistry of California olive oil. The U.S. standard allows for slightly higher levels of campesterol (4.0 in the IOC and between 4.0 and 4.5 in the U.S. standard) and linolenic acid levels (1.0 in the IOC and between 1.0 and 1.5 in the U.S. standard) but subjects the olive oil found to be in these ranges to further testing. The sensory standard for the IOC requires a median of defect score to be between zero and 3.5, in the U.S. standard the range is between zero and 2.5, which means the IOC allows for a slightly higher level of median of defect, as rated by a sensory panel.

CONTINUED

SB 818

Page

8

Prior Legislation

SB 634 (Wiggins), Chapter 694, Statutes of 2008, clarifies the definition of olive oil, repeals previous licensure provisions, conforms olive oil definitions, grades and labeling requirements to international standards, authorizes the addition of vitamin E to specified olive oil, and permits a consumer to re-use a clean olive oil container, can, or drum.

AB 2824 (Berryhill), Chapter 695, Statutes of 2008, clarified the definitions of olive oil similar to SB 634 but was chaptered out by the provisions of SB 634.

SB 920 (Thompson), Chapter 543, Statutes of 1997, specifies that olive oil labeled as California olive oil must be made from California olives. If the olive oil is labeled as coming from a viticultural area, as specified in federal law, 75 percent of the oil must be from olives grown in that viticultural area. Permits the blending of olive oil if the contents and proportions of the blend are prominently displayed on the label.

SB 1666 (Thompson), Chapter 530, Statutes of 1996, establishes a working group of state and industry officials to make recommendations to the Legislature concerning

labeling standards for olive oil.

FISCAL EFFECT : Appropriation: No Fiscal Com.: Yes
Local: Yes

ASSEMBLY FLOOR : 78-0, 8/25/11 (Consent)
AYES: Achadjian, Alejo, Allen, Ammiano, Atkins, Beall,
Bill Berryhill, Block, Blumenfield, Bradford, Brownley,
Buchanan, Butler, Charles Calderon, Campos, Carter,
Cedillo, Chesbro, Conway, Cook, Davis, Dickinson,
Donnelly, Eng, Feuer, Fletcher, Fong, Fuentes, Furutani,
Beth Gaines, Galgiani, Garrick, Gatto, Gordon, Grove,
Hagman, Halderman, Hall, Harkey, Hayashi, Roger
Hernández, Hill, Huber, Hueso, Huffman, Jeffries, Jones,
Knight, Lara, Logue, Bonnie Lowenthal, Ma, Mansoor,
Mendoza, Miller, Mitchell, Monning, Morrell, Nestande,

CONTINUED

SB 818
Page

9

Nielsen, Norby, Olsen, Pan, Perea, V. Manuel Pérez,
Portantino, Silva, Skinner, Smyth, Solorio, Swanson,
Torres, Valadao, Wagner, Wieckowski, Williams, Yamada,
John A. Pérez
NO VOTE RECORDED: Bonilla, Gorell

CTW:kc 8/26/11 Senate Floor Analyses

SUPPORT/OPPOSITION: NONE RECEIVED

**** END ****

CONTINUED

HEARING BACKGROUND INFORMATION

Seals, Certifications & Awards for Olive Oil



California Olive Oil Council

Our SEAL program ensures that the oil you buy in California will be exactly what it claims to be: 100% extra virgin olive oil. To gain certification, you must submit your oil(s) to the COOC Panel of Tasters for sensory evaluation and also have a chemical analysis conducted. The chemical analysis will determine if the oil contains 0.5 % or less free fatty acids as well as a peroxide value of 20 meq O2/kg or less. Additionally, if you produce 100 gallons or more the ultra violet absorbency analysis is also required. =



The **International Olive Council** is the world's only international intergovernmental organization in the field of olive oil and table olives. It was set up in Madrid, Spain, in 1959, under the auspices of the United Nations. It used to be known as the International Olive Oil Council or IOOC until 2006, when its name was changed. The Council is a decisive player in contributing to the sustainable and responsible development of olive growing and it serves as a world forum for discussing policymaking issues and tackling present and future challenges. #

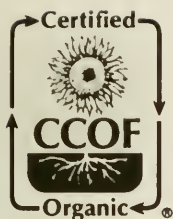


North American Olive Oil Association

In order to use the seal, a company must be a member in good standing of the NAOOA and the type of oil bearing the seal must be tested and must meet the International Olive Council standard for olive oil. The IOC ,is a quasi-United Nations organization.+



The **UC Davis Olive Center** announced the creation of an Olive Oil Taste Panel in November 2009. Its purpose is threefold: to allow olive oils to be certified as extra virgin following the official sensory evaluation criteria and procedures of the International Olive Council (IOC); to provide a full sensory profile of the olive oils to their producers following standard descriptive analysis practices; to act as a descriptive analysis panel for research projects conducted at the University of California, Davis or collaborating institutions.*



California Certified Organic Farmers (CCOF)

CCOF is a non-profit membership based organic certification and trade association, dedicated to promoting and supporting organic food and agriculture, through a premier organic certification program, trade support, producer and consumer education and political advocacy. CCOF provides certification services to all stages of the organic food chain from farms to processors, restaurants and retailers. CCOF certifies to the USDA National Organic Program standards and CCOF international standards.*



Protected Designation of Origin (PDO)

Protected Designation of Origin - EU definition, PDO products are most closely linked to the concept of terroir — a sense of place discernible in the flavor of the food. PDO products must be produced, processed and prepared in a specific region using traditional production methods. The raw materials must also be from the defined area whose name the product bears. The quality or characteristics of the product must be due essentially or exclusively to its place or origin, i.e., climate, the nature of the soil and local know-how.*



Protected Geographical Indication (PGI)

Protected Geographical Indication - The product is produced in the geographical region whose name it bears. The geographical link must occur in at least one stage of production, processing or preparation. It is sufficient for only one of the stages of production to have taken place in the defined area; for instance, the raw materials may come from another region. This allows for a more flexible link to the region and can focus on a specific quality, reputation or other characteristic attributable to that geographical origin.*



Traditional Specialty Guaranteed (TSG)

Traditional Specialty Guaranteed - These products are linked to traditional production methods rather than the region in which they were made. They should be produced either from traditional materials or produced using traditional techniques.*



Safe Quality Food Institute (SQFI)

The Safe Quality Food Institute (SQFI) is a division of the Food Marketing Institute (FMI), an association that conducts programs in public affairs, food safety, research, education and industry relations on behalf of its 1,500 member companies - food retailers and wholesalers - in the United States and around the world.*



American Culinary Federation (ACF) Seal of Approval

The American Culinary Federation offers an ACF Seal of Approval. Labels such as Cargill, Crisco and the Smucker Co. bear the ACF's seal.*



Vegan Logo

Vegan Action's Certified Vegan logo - trademarked in 1999.+



Star-K Kosher Certification

Star-K Kosher Certification, overseen by an organization of rabbis, food technologists, and field supervisors since 1947.*

EXAMPLES

AND

OUTCOMES

OF

OLIVE OIL

FRAUD



October 18, 2011

California's Olive Oils Challenge Europe's

By JULIA MOSKIN

AMERICAN food lovers have long taken for granted that only olive oils from the Mediterranean are worth buying — preferably with an olive tree, an Italian flag and some words like “authentic cold pressed” on the bottle.

But in the last decade, California producers have mounted a major new effort to bring back the domestic olive oil industry, planting thousands of acres, building new mills and producing oils that can be fresher, purer and cheaper than all but the finest imports.

The California olive oil trade, started by 16th-century Spanish missionaries, was almost dead 10 years ago, except for small-scale producers along the Pacific Coast and in the wine country.

“Many people loved the romance of olive oil,” said Deborah Rogers, an owner of the Olive Press, a mill and orchard in Sonoma, Calif. “But no one could figure out how to make any money at it.”

Less than 2 percent of the olive oil consumed in the United States is produced here. But that figure is nudging upward as companies like California Olive Ranch, Corto Olive and Apollo have produced oils that are priced to compete not only in specialty stores, but in supermarkets. They’re using two powerful tools: intensive farming systems already in wide use around the Mediterranean, and a self-imposed bureaucracy that has tried to set a new domestic standard for purity, just as imported olive oil has come under increased scrutiny.

At the California Olive Ranch north of Sacramento, where last week was the beginning of the annual harvest, most of the trees are less than a decade old. But with 13,000 acres under cultivation, the company is already the largest producer of extra-virgin olive oil in the country.

"These trees have a precocious growth spurt and high oil content," said Adam Englehardt, the field manager, who comes from a family that has been farming in nearby Artois (that's AR-toyce, not ar-TWA), for five generations.

As long as the olive oil is reasonably priced and reasonably tasty, should American cooks care where it's from? There are the usual arguments for buying local food: supporting domestic agriculture and the jobs it creates, reducing fossil-fuel consumption by limiting transport, a fresher product.

"Olive oil is a fresh, live product, and it is at its best at the source and the time of the harvest," Ms. Rogers said.

Certified extra-virgin olive oils from the European Union are required to have a "best by" date on the label. But labels cannot always be trusted. When it comes to shopping for olive oil, an extra layer of caution is drizzled on.

Tom Mueller, the author of the soon-to-be-published "Extra Virginity: The Sublime and Scandalous World of Olive Oil," writes that since the time of the Phoenicians, growers around the Mediterranean have dealt with — and in — counterfeit olive oil. And in modern times, cheaper oils are often disguised as extra-virgin olive oil.

"It's not legal anywhere, but it happens everywhere," Mr. Mueller said in an interview.

Four years ago, Mr. Mueller, who lives in Liguria, Italy, published a hair-raising article on black market olive oil in the New Yorker that changed the mind-set of every cook who read it.

It described a network of rogue tanker captains and unscrupulous bottlers that reaches from the Mediterranean to Mumbai, Rotterdam and Galveston, Tex., dedicated to doctoring old, inferior and fake oils. They are chemically deodorized, spiked with chlorophyll and beta-carotene to turn them greenish-gold, then labeled with meaningless terms like "cold pressed" or "100 percent pure" and sold as the finest extra virgin.

Such oil is not dangerous to eat. But it lacks the flavor and health-giving properties of true extra virgin, and is certainly not worth the high prices it commands at markets. "I could buy that oil at the Port of Oakland any day of the week for \$10 a gallon," Mr. Englehardt said.

Bulk prices for true extra-virgin oils are around \$20 a gallon.

Loopholes in European Union regulations generate another category of deception, according to Mr. Mueller. For example, much of the oil produced in Spain is trucked to Italy, where it is repackaged legally as “Italian” oil.

False labels on imported oil are common at every level of the marketplace but the very top, experts agree. The American trade, much smaller and less prestigious, has not offered the same opportunities for fraud, and has remained relatively clean.

This, Mr. Mueller and others say, has given New World producers the opportunity to stake a claim that they can provide the purest oil.

The International Olive Council, the global governing body based in Madrid, tests oils by checking levels of oleic acid (a healthful fatty acid found in olive oil) and polyphenols (which indicate freshness), and getting the judgment of trained tasters. Last October, the United States Agriculture Department adopted similar standards, but they are voluntary, and so far not a single bottle on the market has gone through the full certification process at the department’s new testing center in Blakely, Ga.

In the absence of federally certified extra virgin, the California Olive Oil Council, a trade group, has created a similar certification process for oils in the state, with special labels granted to those that pass. The council has been helped by the Olive Center, a research facility that opened in 2008 at the University of California, Davis. Last year, the Olive Center released a surprising study, based on laboratory and sensory testing, that found that 69 percent of imported extra-virgin olive oils — including big brands like Bertolli, Filippo Berio and Carapelli — bought off the shelves of California supermarkets failed to meet international standards. Most likely, the study concluded, many of them were simply not extra-virgin olive oil at all. The study was financed in part by the major California olive oil producers. (Nine of 10 California oils tested passed.)

Partisans of Old World oils say that testing supermarket products proves nothing about the relative quality of imported and domestic oils.

“You can’t decide that all imported oils are suspect and dismiss thousands of years of craftsmanship,” said Nancy Harmon Jenkins, an American expert who farms olives in Tuscany (and who has written for The New York Times).

They also criticize the cultivation and production methods used in California. An acre of high-density olives can contain up to 900 trees; traditional groves hold fewer than 100. Martina Rossi Kenworthy, an importer who buys top-quality oils directly from producers in Italy,

said that high-density growing drains the soil of nutrients and changes the trees in ways that affect the flavor of the oil.

But Paul Vossen, an agronomist affiliated with the Olive Center who has advised olive growers in the state for 30 years, called that idea “a bunch of baloney.” He said high-density planting currently works only with certain varieties — arbequina and arbosana from Spain, and koroneiki from Greece — but for those, the practice is no different from other kinds of farming.

In a high-density grove, the trees are tightly pruned so they can be mechanically picked by a harvester that sucks the olives off the branch at the precise moment of ripeness. In traditional groves, the olives are raked or shaken from the trees and gathered up later, a time-consuming and expensive process.

Those who believe in high-density planting say that its rapid harvest actually produces superior oil, free of the over-ripe and damaged fruits that are an inevitable byproduct of the traditional harvest. In a blind tasting by the Dining section (see article), California Olive Ranch oil held its own against top-flight Italian oils, showing a promising balance of golden, buttery smoothness and peppery acidity.

“They can make good oils with high density,” said Ms. Rogers, whose own groves are planted in the traditional manner. “But it remains to be seen if they can make great oils.”

Tasting Olive Oils

ALONG with laboratory analysis, testing olive oil still involves human taste. To learn how the experts do it, the Dining section asked Martina Rossi Kenworthy, an importer, and her colleague Stefano Noceti, a certified master taster in Italy, to guide a blind tasting of extra virgin oils, including some from their warehouse, supermarket brands and California products.

All the oils were dark gold, yielding a nugget of useful information: only freshly pressed oil is green, and it soon turns gold in the bottle, making color a weak indicator of quality. As we tasted — eating bites of tart green apple between oils to cut the richness — Martina and Stefano noted (with pleasure) flavors of artichoke, almond, green tomato and fresh-cut grass, and (with sadness) notes of banana, mushroom and bubble gum.

Even blind, they were able to pick out the most expensive oils (Pianogrillo from Sicily, \$34.75, and Vicopisano from Tuscany, \$43; all prices are for half-liter bottles). Those had an

undeniable “liveliness” — a tingly acidity, balancing out the richness of oil — that made them complex and delicious. They also liked an arbequina oil made by California Olive Ranch, much less costly at \$13.99. All those oils had some of the throat-burning quality that reveals the presence of polyphenols, antioxidants that make olive oil healthful. La Mozza, an oil from Mario Batali (\$25.80), was healthful enough to cause a panel-wide coughing fit.

My colleague Florence Fabricant was first to say that the other oils were surprisingly bland, if pleasant enough. Filippo Berio (\$8.49) fell into this category; so did Olivista from California (\$10.99) and San Giuliano Alghero, an inexpensive Italian extra virgin oil (\$11.80).

Mr. Noceti said that some oils produced for the American market are purposefully made smooth: we are perceived as timid when it comes to olive oil. And even oils that start out robust and peppery quickly flatten out, especially if stored in clear containers and above 65 degrees.

Over all, personal taste and then freshness are your best guides in the slippery, crowded oil aisles. Extra virgin oils produced in the European Union must state either the year of the harvest or a “best by” date on the label: two years is considered the longest possible shelf life.

Olive oil is at its peak of flavor when pressed, and — melodramatic, but true — begins to deteriorate as soon as it is bottled.

THE NEW YORKER

LETTER FROM ITALY

SLIPPERY BUSINESS

The trade in adulterated olive oil.

BY TOM MUELLER

AUGUST 13, 2007

On August 10, 1991, a rusty tanker called the Mazal II docked at the industrial port of Ordu, in Turkey, and pumped twenty-two hundred tons of hazelnut oil into its hold. The ship then embarked on a meandering voyage through the Mediterranean and the North Sea. By September 21st, when the Mazal II reached Barletta, a port in Puglia, in southern Italy, its cargo had become, on the ship's official documents, Greek olive oil. It slipped through customs, possibly with the connivance of an official, was piped into tanker trucks, and was delivered to the refinery of Riolio, an Italian olive-oil producer based in Barletta. There it was sold—in some instances blended with real olive oil—to Riolio customers.

Between August and November of 1991, the Mazal II and another tanker, the Katerina T., delivered nearly ten thousand tons of Turkish hazelnut oil and Argentinean sunflower-seed oil to Riolio, all identified as Greek olive oil. Riolio's owner, Domenico Ribatti, grew rich from the bogus oil, assembling substantial real-estate holdings, including a former department store in Bari. He bribed two officials, one with cash, the other with cartons of olive oil, and made trips to Rome, where he stayed at the Grand Hotel, and met with other unscrupulous olive-oil producers from Italy and abroad. As one of Italy's leading importers of olive oil, Ribatti's company was a member of ASSITOL, the country's powerful olive-oil trade association, and Ribatti had enough clout in Rome to ask a favor—preferential treatment of an associate's nephew, who was seeking admission to a military officers' school—of a high-ranking official at the Finance Ministry, a fellow-pugliese.



"Fraud is so widespread that few growers can make an honest living," one expert says.

However, by early 1992 Ribatti and his associates were under investigation by the Guardia di Finanza, the Finance Ministry's military-police force. One officer, wearing a miniature video camera on his tie, posed as a waiter at a lunch hosted by Ribatti at the Grand Hotel. Others, eavesdropping on telephone calls among Riolo executives, heard the rustle of bribe money being counted out. During the next two years, the Guardia di Finanza team, working closely with agents of the European Union's anti-fraud office, pieced together the details of Ribatti's crime, identifying Swiss bank accounts and Caribbean shell companies that Ribatti had used to buy the ersatz olive oil. The investigators discovered that seed and hazelnut oil had reached Riolo's refinery by tanker truck and by train, as well as by ship, and they found stocks of hazelnut oil waiting in Rotterdam for delivery to Riolo and other olive-oil companies.

The investigators also discovered where Ribatti's adulterated oil had gone: to some of the largest producers of Italian olive oil, among them Nestlé, Unilever, Bertolli, and Oleifici Fasanese, who sold it to consumers as olive oil, and collected about twelve million dollars in E.U. subsidies intended to support the olive-oil industry. (These companies claimed that they had been swindled by Ribatti, and prosecutors were unable to prove complicity on their part.)

In 1997 and 1998, olive oil was the most adulterated agricultural product in the European Union, prompting the E.U.'s anti-fraud office to establish an olive-oil task force. ("Profits were comparable to cocaine trafficking, with none of the risks," one investigator told me.) The E.U. also began phasing out subsidies for olive-oil producers and bottlers, in an effort to reduce crime, and after a few years it disbanded the task force. Yet fraud remains a major international problem: olive oil is far more valuable than most other vegetable oils, but it is costly and time-consuming to produce—and surprisingly easy to doctor. Adulteration is especially common in Italy, the world's leading importer, consumer, and exporter of olive oil. (For the past ten years, Spain has produced more oil than Italy, but much of it is shipped to Italy for packaging and is sold, legally, as Italian oil.) "The vast majority of frauds uncovered in the food-and-beverage sector involve this product," Colonel Leopoldo Maria De Filippi, the commander for the northern half of Italy of the N.A.S. Carabinieri, an anti-adulteration group run under the auspices of the Ministry of Health, told me.

In Puglia, which produces about forty per cent of Italy's olives, growers have been in a near-constant state of crisis for more than a decade. "Thousands of olive-oil producers are victims of this 'drugged' market," Antonio Barile, the president of the Puglia chapter of a major farmers' union, told me, referring to illegal importations of seed oils and cheap olive oil from outside the E.U., which undercut local farmers. Instead of supporting small growers who make distinctive, premium oils, the Italian government has consistently encouraged quantity over quality, to the benefit of large companies that sell bulk oil. It has not implemented a national plan for oil production, has employed a byzantine system for distributing agricultural subsidies, and has

often failed to enforce Italian laws and E.U. regulations intended to prevent fraud. The government has been so lax in pursuing some oil crimes that it can seem complicit. In 2000, the European Court of Auditors reported that Italy was responsible for eighty-seven per cent of misappropriated E.U. subsidies to olive-oil bottlers in the preceding fifteen years, and that the government had recovered only a fraction of the money.

Paolo De Castro, who was appointed Italy's agriculture minister in 2006, told me that olive-oil fraud has been a problem in the past but that he was taking action to curb it. "In the past few years, we have tightened things up a lot, through our Inspectorate for Quality Control, and through our *carabinieri* corps," he said. One problem is that Italian officials charged with detecting adulterated oil can, in theory, be held liable for their actions. "Who's going to take this responsibility?" asked Lanfranco Conte, a professor of food chemistry at the University of Udine, who in the early nineties was the head of a laboratory belonging to the Agriculture Ministry's anti-fraud unit. "If you decide to block three thousand tons of oil and it turns out you were wrong, you pay out of your own pocket." Colonel De Filippi acknowledged that some companies are essentially immune to investigation. "Unfortunately, there are big producers who have strong political ties," he said.

The olive is a drupe, or stone fruit, like a plum or a cherry. Most vegetable oils are extracted in a refinery from seeds or nuts, using solvents, heat, and intense pressure; the best olive oils are made using a simple hydraulic press or centrifuge—they are more like fresh-squeezed fruit juices than like industrial fats. The olives are harvested at the moment of the *invaiaura*, when they begin to turn from green to black; ideally they are picked by hand and milled within hours, to minimize oxidation and enzymatic reactions, which leave unpleasant tastes and odors in the oil. There are approximately seven hundred olive varieties, or cultivars, whose distinctive tastes and aromas are evident in oils that are made properly, just as different grape varieties are expressed in fine wines.

In the past decade, olive-oil consumption has risen thirty-five per cent in southern Europe, its traditional market, and more than a hundred per cent in North America. Much of the growth is due to the increasing prestige of the highest-quality olive oil, extra-virgin. (The European Union also recognizes several inferior grades, including virgin and *lampante*, or "lamp oil," which is made from olives that have spoiled and fallen from trees, and cannot legally be sold as food.) In Italy, where most olive oil is labelled "extra-virgin," competitions, public tastings, and "oil bars" have proliferated.

According to E.U. law, extra-virgin oil must be made exclusively by physical means (by a press or a centrifuge) and meet thirty-two chemical requirements, including having "free acidity" of no more than 0.8 per cent. (In olive oil, free acidity is an indicator of

decomposition.) Virgin oil, the next grade lower, must have free acidity of no more than two per cent. Oil that has a greater percentage of free acidity is classified as *lampante*.

Most olive-oil frauds are easy to detect using chemical tests. In February, 2005, the N.A.S. Carabinieri broke up a criminal ring operating in several regions of Italy, and confiscated a hundred thousand litres of fake olive oil, with a street value of six million euros (about eight million dollars). The ring, which allegedly sold its products in northern Italy and in Germany, is accused of coloring low-grade soy oil and canola oil with industrial chlorophyll, flavoring it with beta-carotene, and packaging it as extra-virgin olive oil in tins and bottles emblazoned with pictures of Italian flags or Mt. Vesuvius, and with folksy names of imaginary producers—the Farmhouse, the Ancient Millstones.

More sophisticated scams, like Domenico Ribatti's, typically take place at high-tech refineries, where the oil is doctored with substances like hazelnut oil and deodorized *lampante* olive oil, which are extremely difficult to detect by chemical analysis. In 1991, the E.U., recognizing that laboratory tests fail to expose many acts of adulteration, instituted strict taste and aroma requirements for each grade of olive oil and established tasting panels, certified by the International Olive Oil Council, an office created by the United Nations, to enforce them. According to the E.U. regulations, extra-virgin oil must have appreciable levels of pepperiness, bitterness, and fruitiness, and must be free of sixteen official taste flaws, which include "musty," "fusty," "cucumber," and "grubby." "If there's one defect, it's not extra-virgin olive oil—*basta*, end of story," Flavio Zaramella, the president of the *Corporazione Mastri Oleari*, in Milan, one of the most respected private olive-oil associations, told me.

Zaramella, a garrulous sixty-six-year-old former businessman, has made oil from olives grown on his small farm in Umbria since 1985. He began to study olive oil systematically when he found that the local farmer who tended his trees had been cutting his oil with sun-flower-seed oil. "Fraud is so widespread that few growers can make an honest living," he told me. Four recent operations for abdominal cancer have left him gaunt, but Zaramella still has plump, mobile hands and speaks in a mellow baritone. On a wall in his office is a map of Somalia, where, in 1987, as the head of a humanitarian-aid project, he supervised the construction of a high-tech hospital in Baraawe, a city on the Indian Ocean. "I got everyone working together: Communists, Catholic priests, Muslims, professors, illiterates, anyone with the will to get things done," he recalled. Two months after the hospital was completed, it was destroyed in the civil war. "Generosity is the purest form of egotism," he said.

Zaramella became the president of *Mastri Oleari* in 2000, and is devoting his remaining years to redeeming extra-virgin olive oil from fraud. He calls his fight for olive-oil quality a "civic responsibility," both to consumers and to the many small producers who struggle to make a living in a market awash in cheap, counterfeit oil.

One morning last October, the Mastri Oleari's olive-oil tasting panel—six men and three women—conducted a test of five premium oils, all known to be extra-virgin. The test was a training exercise, one of about twenty that the panelists perform each year to keep their tasting skills sharp. (The panel, along with nineteen others in Italy, recently lost its E.U. accreditation, after the International Olive Oil Council suffered budget cuts and decided that it would no longer certify panels run by private institutions.) The Mastri Oleari's tasting room consisted of eight cubicles, which isolate panel members to prevent them from influencing one another's judgments. (The panel leader, who coordinates the team, often does not taste the oils.) Each cubicle contained a sink, several tulip-shaped tasting glasses with lids to trap aromas, and a yogurt-maker with a thermostat, used to warm the glasses to twenty-eight degrees Celsius, the temperature at which the aromatic substances in the oil are volatilized, making it optimum for tasting.

By 10 A.M., the panel members had arrived, grumbling about having been deprived of their morning coffee and cigarettes, which are forbidden before a tasting, because they dull the senses. The group included, in addition to Zaramella, a thirty-three-year-old olive miller from Lake Garda and a forty-seven-year-old Tuscan marquess who worked as a personal motivation coach. After Zaramella's assistant had poured the oil samples into the tulip glasses and warmed them, the panelists entered their cubicles. Cradling the glasses containing the first sample in their palms to keep the oil warm, they removed the lids, inserted their noses, and snuffled loudly, some closing their eyes. They sipped the oil, and began sucking in air violently, a technique known as *strippaggio*, which coats the taste buds with oil and helps its aromas ascend to the nasal passages. After the first volcanic slurps, the *strippaggi* grew softer and more meditative, and took on personal notes, the marquess's wheezy and almost wistful, Zaramella's deep and wet, as if he were gargling Epsom salts.

The tasters remained in their cubicles for the next hour, snuffling and slurping, and periodically cleansing their palates with mineral water. After sampling each oil, they rated its tastes, aromas, texture, and other characteristics on a scoring sheet. The panel's leader, Alfredo Mancianti, collated the sheets, and assigned a score to each oil based on the tasters' judgments. The Mastri Oleari panelists were remarkably consistent, agreeing not only on the subtle flavors—artichoke, fresh-cut grass, green tomato, kiwi—suggested by the oils but also on their intensity.

Even the most creative criminals have difficulty outwitting a properly trained tasting panel. "It's like a machine," Zaramella told me. "When I see that the oil is peppery, bitter, and smells of olives, rest assured that everything else is automatic." And yet, according to Zaramella, Italian authorities rarely perform panel tests, and almost never on oil before it is sold. When oil fails a taste test, producers often successfully appeal the verdict by arguing that the samples

were incorrectly collected or stored, or they secure a favorable judgment from a more permissive panel. In Italy, eight of the nine remaining panels of record—those empowered to pronounce legally binding opinions on olive-oil quality—belong to national government agencies. The only panel of record that does not belong to a national body, in Florence, curtailed its taste-testing activities in 2004, after it and two other local panels determined that extra-virgin oils made by Carapelli, Bertolli, Rubino, and other leading Italian brands were in fact virgin or *lampante*, and one of the panels was sued by Carapelli. (A Florence court threw out the case.)

Olive-oil fraud was already common in antiquity. Galen tells of unscrupulous oil merchants who mixed high-quality olive oil with cheaper substances like lard, and Apicius provides a recipe for turning cheap Spanish oil into prized oil from Istria using minced herbs and roots. The Greeks and the Romans used olive oil as food, soap, lotion, fuel for lamps and furnaces, a base for perfumes, and a cure for heart ailments, stomach aches, hair loss, and excessive perspiration. They also considered it a sacred substance; cult statues, like the effigy of Zeus at Olympia, were rubbed regularly with oil. People who bathed or exercised in Greek gymnasiums anointed their bodies as well, using oils that were scented with pressed flowers and roots. Some scholars link the central place of olive oil in Greek sports, which were performed in the nude, with the rise of bronze statuary in the sixth century B.C. “A tanned athlete, shining in the summer sun, covered with oil, would really resemble a statue of the gods,” Nigel Kennell, a specialist in ancient history at the American School of Classical Studies at Athens, said. Belief in the sacred, health-giving properties of olive oil continued in Judaism, Christianity, and Islam. “Christ” is from the Greek *christos*, meaning “the anointed one”—anointed with olive oil.

By the first century A.D., olives were a cash crop in the Roman Empire; in some regions, per-capita consumption of olive oil was as much as fifty litres a year. “People were prepared to spend the same amount of money on olive oil back then as they do on petroleum today,” Kennell said. “And governments went to great lengths to insure a steady supply of it.” The family of Septimius Severus, who was emperor from 193 to 211, grew rich on oil in Leptis Magna, a city in the Tripolitania region of North Africa (now Libya). “I’ve always thought of him as somewhat parallel to an oil sheikh,” David Mattingly, a professor of Roman archeology at the University of Leicester who studies Roman olive cultivation, told me. Severus introduced the first regular free distribution of olive oil in Rome—what might be called the bread-and-circuses-and-olive-oil approach to wooing the masses. The emperors Trajan and Hadrian were from the Baetica region of southern Spain (now Andalusia), and their accession triggered a boom in Baetica olive-oil exports. So much Baetica oil was sent to Rome that the amphorae in which it was transported, disposed of at a dump at the southeastern edge of the city, grew to a hill fifty metres high, known today as Monte Testaccio, or Mt. Potsherd.

The amphorae show evidence of extensive anti-fraud measures: each was painted with the exact weight of oil it contained, along with the name of the farm where the olives were pressed, the merchant who shipped the oil, and the official who verified this information before shipment. Reverse checks were presumably performed at Monte Testaccio when the amphorae were emptied, to confirm that the weight and quality had not changed during shipment. “The biggest danger was that merchants would substitute an inferior product en route, and the explicit labelling of goods was clearly designed to counter this,” Mattingly said.

In other words, the ancient Romans anticipated fraud of the kind perpetrated by Domenico Ribatti, and took more effective steps to prevent it than Italians do today. In April, Paolo De Castro, the agriculture minister, announced that the government had investigated seven hundred and eighty-seven olive-oil producers and found that two hundred and five were guilty of adulteration, false labelling, and other infractions. Yet it will be years before the cases are adjudicated, and most of the alleged violations are unlikely to result in substantial fines or jail sentences. De Castro has also proposed legislation that would require bottlers of extra-virgin and virgin oil to declare on their labels the oil’s country or countries of origin. But many observers believe that the legislation, known as the “Made in Italy” decree, contradicts existing E.U. regulations and will be struck down. “This decree is nothing but a cunning trick intended to pass back through the window what the E.U. has already tossed out the door,” Giorgio Fontana, a lawyer who has studied olive-oil legislation, says.

In March, 1993, Domenico Ribatti was arrested, along with his chief chemist and three other accomplices, and charged with contraband, fraud against the European Union, operating a criminal network, and other crimes. During an extended legal battle, he insisted that he had been defrauded by his suppliers—Caribbean shell companies that had sold Riolo hazelnut oil instead of olive oil. But when Pascal Brugger, a Swiss financier who managed these companies, turned state’s evidence, and revealed that Ribatti himself controlled them, his defense collapsed. In the end, Ribatti plea-bargained a thirteen-month prison term. (Ribatti, who has since left the olive-oil business, denied that he had committed any crimes. “I was just the scapegoat,” he told me.)

Leonardo Colavita, the president of ASSITOL, the olive-oil trade association, and the owner of Colavita, the olive-oil company, told me that the group’s policy is to expel member companies that are accused of illegal activity, so that, as he put it, “no one can attack us, no one can say, ‘You have criminals in your organization!’ ” According to Colavita, when Ribatti resigned from the organization he said, “If I leave, everybody’s got to leave.” Using the diminutive of Ribatti’s name, Colavita said, “Mim-mo Ribatti was a gentleman, because he didn’t name names. If he had named names, a lot of folks would have gone to jail.”

While investigating Ribatti, the E.U. anti-fraud team discovered that the two tankers he had used had also transported contraband olive oil to the port of Monopoli, in Puglia. The team traced the oil to an acquaintance of Ribatti's named Leonardo Marseglia, the managing director of an olive-oil and vegetable-oil company in Monopoli. The company, now called Casa Olearia Italiana, became one of the leading olive-oil importers in Europe and owns one of the largest edible-oil refineries in the world.

In 1994, eighty agents from the Guardia di Finanza raided Casa Olearia and seized documents detailing four illegal shipments of oil involving the Mazal II and the Katerina T. In July, 1996, an arrest warrant was issued for Marseglia and sixteen business associates, on charges that included contraband, E.U. tax fraud, and operating a criminal network. Three weeks later, Marseglia, accompanied by his lawyer, surrendered to the authorities and was jailed. Prosecutors accused him of importing Tunisian olive oil falsely identified as a product of Europe, thus evading the duty imposed on non-European goods, and of illegally receiving E.U. olive-oil subsidies when, later, he sold the oil. Domenico Seccia, the prosecutor in the case, who also prosecuted Ribatti, believes that Marseglia taught Ribatti the criminal techniques for which Ribatti was eventually convicted. "Ribatti inherited from Marseglia all the methods and procedures of the fraud," Seccia told me. "The Marseglia case is identical to Ribatti's."

In a ruling on January 13, 1997, Italy's Supreme Court noted that the magistrate who authorized the arrests of Marseglia and his associates had "amply demonstrated, with documentary evidence, that the product unloaded in Monopoli was extra-EC olive oil from Tunisia, free from import tariffs, which was subsequently made to appear to be Italian olive oil using false sales transactions, resulting in serious EC fraud." The court also noted that the magistrate had ordered the men's arrests because of what he considered "the concrete risk that similar activities would be repeated," and because of the "criminal character of the defendants." Nonetheless, after years of judicial wrangling, the prosecutors were unable to win convictions, and the charges against Marseglia and his associates were dismissed in 2004, when the statute of limitations in their cases expired.

Last December, I travelled to Monopoli to visit Marseglia at Casa Olearia. Driving south from the airport in Bari, I followed the coastal highway through ancient olive groves, where the trees are of the local *ogliarola* cultivar, some of them nearly a thousand years old. Since 1994, Antonio Barile, the farmers'-union president, has led tens of thousands of olive farmers in blockades of the ports of Monopoli and Bari, where many tankers carrying oil arrive. Barile said that some oil shipments entering Italy with government approval are in violation of European law, which allows oil to be imported from countries outside the E.U. when local supplies cannot meet demand. So much of this cheaper foreign oil enters the local market that, for example, according to investigators at the Guardia di Finanza, only one per cent of the oil

made in Puglia during the 2003-04 harvest and intended for sale in Italy actually sold at a profit for local producers.

At Monopoli, the highway skirts the Casa Olearia plant: stainless-steel silos, office buildings, smokestacks, and warehouses set, incongruously, in a grove of huge olive trees. Since Marseglia bought the complex, in 1981, it has grown fif-teenfold; in 2005, the company processed about a million tons of olive oil and vegetable oils. The Italian press has called Marseglia, who began his career driving a delivery truck for his family's olive-oil company, the "baron of extra-virgin." Nonetheless, last year Marseglia left the olive-oil business to concentrate on making biodiesel fuels and electricity. In these fields, he told me, the authorities "break your balls less."

Marseglia is sixty-one, and has the powerful frame, thick neck, and heavy-lidded eyes of an aging prizefighter. Despite a habit of referring to himself in the first-person plural, he is disarmingly informal; he prodded my arm companionably from time to time to emphasize a point. I asked him whether he was guilty of any of the crimes with which he had been charged. "We have never been convicted of anything up to this point," he replied. "Therefore we don't think there's anything to add. We have suffered trials, and we have been acquitted because the events did not take place." He added that he had earned the resentment of local farmers by importing foreign olive oil, which is necessary, he insisted, not only to satisfy Italy's internal demand but also to bolster the shoddy quality of some of the local *pugliese* oil. "You have to import six hundred thousand to seven hundred thousand tons a year," he said. "And since we imported a lot, to make blends to save many bad, smelly local oils, people basically saw it as an affront." (Marseglia denied that he has ever adulterated his olive oil with other vegetable oils.)

Marseglia estimated that ninety per cent of oil sold in Italy as extra-virgin isn't of premium grade. "It's anything but extra-virgin, the oil we have here," he said. He did not seem to think that this was a problem. "First of all, let's give people good oil," he said. "Then the excellent—all the extraordinary stuff at forty or fifty euros a kilo, which a few idiots in the world can afford—we'll think about that later, no?" He told me that his family uses ordinary oil: "For us, the concept of 'good' is enough. We want to be average folks."

Over lunch in the Casa Olearia canteen, Marseglia showed me what he meant by good oil. Techniques like *strippaggio* are "all hot air," he said. "Tasting a plate of pasta is easy. Tasting a glass of wine is easy. Tasting a piece of fruit is easy. Tasting oil is the same. It has to have the same pleasurable tastes. If it has an unpleasant one, it's not good—that's pretty simple. They say you need a lot of knowledge to understand it, because they want to make the subject seem more intellectual."

He reached across the table for a bottle of Giusto, his company's supermarket label, unscrewed the cap, and pointed it at me. "Smell this. Does it smell good, or stink?"

It smelled good: a tart, intensely green fragrance that I'd come to associate with *coratina*, a popular olive cultivar in Puglia.

Marseglia brought the bottle to his lips and tipped in two big glugs. "So you put it in your mouth, right?" he said thickly, through the oil. "Either it's disgusting, and you spit it in somebody's face, or it's good." The sign of a good oil, he went on, is the *bocca bella* ("pretty mouth"), the pleasant taste and sensation that remains in the mouth after you've swallowed the oil.

Marseglia passed me the bottle. "Now you taste it, without doing what those other guys do," he said. "Pretend you're eating a candy, something good. Then we'll see how it leaves your mouth." He watched my face intently as I swallowed the oil, then nodded, satisfied. "Tasting things is simple," he said.

In January, Marseglia was arraigned on charges relating to another olive-oil crime, this one involving the United States. According to documents compiled by investigators of the Guardia di Finanza, between 1998 and 2004 Casa Olearia evaded more than twenty-two million euros (about thirty million dollars) in E.U. duties by illegally importing seventeen thousand tons of Turkish and Tunisian olive oil, apparently with the coöperation of Italian customs officials. E.U. law allows non-European companies to ship oil duty-free to Italy for processing by an Italian company; however, investigators say that AgriAmerica, the American firm that Casa Olearia claims imported the oil, was a shell company created by Marseglia in order to evade customs duties. The oil was processed in the Casa Olearia laboratories, where investigators suspect that it was mixed with other vegetable oils, though they have been unable to prove this. Some of the oil was bought by Italian companies, but the bulk was shipped to distributors in the United States, who sold it as Italian olive oil.

The American market, which is worth about one and a half billion dollars, is the largest outside Europe, and is growing at a rate of ten per cent a year. Yet the Food and Drug Administration considers olive-oil fraud a relatively rare problem and does not routinely test oils for adulteration. Instead, the agency relies on major producers and trade groups, like the North American Olive Oil Association—whose members include several companies that also belong to ASSITOL—to alert it to suspicious products. With the industry acting as a watchdog, Martin Stutsman, a specialist in adulterated food at the F.D.A., told me, "you don't waste your resources on surveys that are likely to make somebody comfortable but that don't do much toward protecting the public health."

In February, 2006, federal marshals seized about sixty-one thousand litres of what was supposedly extra-virgin olive oil and twenty-six thousand litres of a lower-grade olive oil from a New Jersey warehouse. Some of the oil, which consisted almost entirely of soybean oil, was destined for a company called Krinos Foods, a member of the North American Olive Oil

Association. Krinos blamed the fraud on its supplier, DMK Global Marketing, which in turn blamed the Italian bottlers from whom it had bought the oil. The marshals destroyed the oil, but no criminal charges were brought against Krinos or any other companies. "My experience over a period of some fifty years suggests that we can always expect adulteration and mislabelling of olive-oil products in the absence of surveillance by official sources," David Firestone, an F.D.A. chemist who was the agency's olive-oil specialist from the mid-sixties to 1999, told me.

In September, Marseglia and five associates will be tried at a closed hearing in Puglia for their role in the AgriAmerica case. They have been charged with forming a criminal network for the purpose of committing contraband, but an investigator familiar with the case says that Marseglia is unlikely to be convicted. "He has protection at the highest levels, from right to left across the political spectrum," the investigator told me. (Marseglia, citing the ongoing nature of the case, declined to comment on the charges against him but said that he expected to be found innocent, as he had been in previous investigations.)

Casa Olearia remains a member of ASSITOL, which has considerable influence in both Rome and Brussels. The Italian government's Technical Commission of Oils and Fats, a group that helps draft olive-oil regulations, includes several heads of laboratories belonging to ASSITOL members; its chair is Enrico Tiscornia, a longtime scientific consultant to ASSITOL, who also serves on an analogous board in Brussels. Moreover, ASSITOL recently collaborated with the Italian Ministry of Agriculture on a proposal to create a "Mediterranean Axis of Olive Oil," which a 2004 government document described as "an informal cartel of international dimensions among olive-oil producers." According to Colavita, ASSITOL's president, the project was initiated by Gio-vanni Alemanno, the agriculture minister from 2001 to 2006, and would be financed by the Italian government. The goal, he said, was to expand olive-oil production in Syria, Morocco, Turkey, and other southern Mediterranean countries outside the E.U., and to facilitate the sale of the oil in Italy, using a duty-free storage facility in a southern Italian port.

Paolo De Castro, who replaced Alemanno as agriculture minister last year, told me that he was unfamiliar with the project. But when I described it to him he said that he supported its aims. "We have to avoid distortions, not place limits on business," he told me. "The important thing is that people don't act like wise guys, and that this Tunisian oil doesn't become extra-virgin olive oil from Puglia. Now, this is quite a little problem, eh?" De Castro added that his "Made in Italy" decree, which would require distributors to declare the provenance of their oil on labels, would prevent them from misleading the public. "You write it, and there's no problem," he said.

Leonardo Marseglia dismissed the notion that such a measure could be effective. "Oil doesn't have an identity card; it just goes," he said. "When someone has two silos of oil, one

Italian and the other foreign, you just have to switch them: the other one becomes Italian oil, this one becomes foreign.” Noting that oils labelled “Made in Italy” sell for more than other oils, Marseglia said that De Castro’s legislation would only inspire more fraud. “So what’s going to happen? They’ll do another swindle, and behind the mask of ‘Made in Italy’ there’s foreign oil labelled ‘Made in Italy.’ ” Leonardo Colavita is equally skeptical: “I say that a criminal ought to make the law, because the criminal knows how to outwit the law.” ♦

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The Spanish Toxic Oil Syndrome 20 Years after Its Onset: A Multidisciplinary Review of Scientific Knowledge

Gelp, Emilio; de la Paz, Manuel Posada; Terracini, Benedetto; Abaitua, Ignacio; de la Cernara, Agustín Gmez; Kilbourne, Edwin M.; Lahoz, Carlos; Nemery, Benoit; Philen, Rossanne M.; Soldevilla, Luis; Tarkowski, Stanislaw

May 2002

Environmental Health Perspectives; May2002, Vol. 110 Issue 5, p457
Academic Journal

In 1981, in Spain, the ingestion of an oil, fraudulently sold as olive oil caused an outbreak of a previously unrecorded condition, later known as toxic oil syndrome (TOS), clinically characterized by intense incapacitating myalgias, marked peripheral eosinophilia, and pulmonary infiltrates. Of the 20,000 persons affected, approximately 300 died shortly after the onset of the disease and a larger number developed chronic disease. For more than 15 years, a scientific committee supported by the World Health Organization's Regional Office for Europe and by the Institute of Health Carlos III in Madrid has guided investigation intended to identify the causal agent(s), to assess toxicity and mode of action, to establish the pathogenesis of the disease, and to detect late consequences. This report summarizes advances in research on this front. No late mortality excess has been detected. Among survivors, the prevalence of some chronic conditions (e.g., sclerodermia, neurologic changes) is high. Attempts to reproduce the condition in laboratory animals have been unsuccessful, and no condition similar to TOS has been reported in the scientific literature. Laboratory findings suggest an autoimmune mechanism for TOS, such as high levels of seric soluble interleukin-2 receptor. Epidemiologic studies integrated with chemical analyses of case-related oils have shown that the disease is strongly associated with the consumption of oils containing fatty acid esters of 3-(N-phenylamino)-1,2-propanediol (PAP). These chemicals have also been found in oils synthesized under conditions simulating those hypothesized to have occurred when the toxic oil was produced in 1981. Whether PAP esters are simply markers of toxicity of oils or have the capability to induce the disease remains to be elucidated.

China Scrutinizes Olive Oil Imports from Italy

By Vikas Vij

Olive Oil Times Contributor | Reporting from Delhi

China's quality watchdog, Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), has asked its local quarantine and inspection organs to carefully scrutinize the olive oil imports from Italy. It has urged Chinese importers to pay more attention to the quality of the Italian olive oil they are importing.



This unexpected action comes after reports in China that four out of five bottles of olive oil from Italy were adulterated with inferior quality oil from other countries. Following these reports, the AQSIQ has requested the Italian embassy to look into the truth of this matter and provide it more specific information. The AQSIQ has also urged Italy to further improve the quality control and management of its olive oil exports to China.

The problem came to light in December when the La Repubblica newspaper published the results of a probe into Italy's olive oil exports and investigation into the conduct of 13 unnamed Italian olive oil exporters. This led to speculation that about 80 percent of China's olive oil imports carrying the label "Made in Italy" were actually mixed with lower qualities of olive oil from Spain, Greece and Tunisia.

Italy exports 250,000 metric tons of olive oil each year, while it imports nearly double of that volume. Last year Italy's olive oil imports showed an increase of nearly 100,000 tons, which led the authorities to investigate where such large quantities of imports ended up. Statistics reveal that nearly 37.5 percent of China's olive oil imports come from Italy, which makes Italy the second largest olive oil exporter to China after Spain.

Sources:

People's Daily
Adnkronos

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This article was last updated January 10, 2012 - 9:33 AM

Connecticut Puts The Squeeze On Olive Oil Fraud

by DIANE ORSON



Diane Orson/NPR

Food importer Luciano Sclafani says olive oil is "one of mankind's purest foods." When he saw a competitor's products selling for a cheap price, he became suspicious.



Diane Orson/NPR

Romeo Simeone, owner of Romeo and Cesare's market in New Haven, says Connecticut's new purity standards protect honest store owners.

December 18, 2008

text size A A A

Just as wine lovers expect complexity in an outstanding vintage, lovers of olive oil want purity in their favorite extra virgin. High-end olive oil is very expensive to produce — and fraud is a growing problem. When Connecticut officials discovered olive oil that was labeled extra virgin but was really a cheap knockoff, they took action.

In most New England supermarkets, you can't walk down the Italian food aisle without seeing products imported by Luciano Sclafani. His company, which bears his name, sells such foods as canned peeled tomatoes, San Marzano tomatoes, regular tomatoes and pasta products.

But Sclafani says the item that's closest to his heart is the Sclafani olive oil. Olive oil, he says, is "one of mankind's purest foods."

"In fact, we have one product called the Frantoio Unfiltered from Sicily, and this I actually take a half a shot glass every morning to ingest," Sclafani says. "It keeps my hair. Being a young man of 62, it's not white like my compatriots."

A one-liter bottle of Frantoio Extra Virgin sells for \$25. So when Sclafani saw a competitor's three-liter tin selling for \$9.99, he sensed trouble and went straight to the authorities.

Connecticut Department of Consumer Protection Commissioner Jerry Farrell ordered food inspectors to test the suspicious product.

"We came across cans of olive oil that were for sale in Connecticut that had, after testing, these other oils in there — peanut oil, soy oil, hazelnut oil," Farrell says.

In April 2007, FDA investigators and U.S. Marshals seized more than 10,000 cases of olive oil from storage facilities in New York and New Jersey. It turned out that tins labeled as extra virgin contained mostly soybean oil mixed with low grade olive-pomace oil. The seized products had an estimated retail value of more than \$700,000. Amusing as it may sound, Farrell says there's a serious side to the story.

"We saw it as not only that the consumer was being cheated, but their health was being put at risk by these oils being in there and it not being disclosed in any way," he says.

For many people with serious food allergies, nut oils can be fatal. So Connecticut became the first state in the nation to enact standards to protect the purity of olive oil.

They mirror regulations set by the International Olive Council in Spain, and create legal definitions for "virgin," "extra virgin" and "olive-pomace" oil. And the state has the authority to fine wholesalers who sell diluted olive oil without proper labeling.

At Romeo and Cesare's market in New Haven, Conn., owner Romeo Simeone says the new standards also protect honest store owners

"It's very good because the people, they no gotta be influenced for the price, and they no give the quality," he says

New York, New Jersey and Rhode Island say they're interested in setting state standards, but California is next in line. It begins regulating the slippery olive oil industry in January

Diane Orson reports for member station WNPR

Two Convicted in Spain of Olive Oil Fraud Get Jail Time

By Julie Butler

Olive Oil Times Contributor | Reporting from Barcelona

Two Andalusian businessmen have been sentenced to two years in jail for their part in the distribution of hundreds of thousands of liters of fraudulent olive oil in Spain in 2005 and 2006.

Passed off as extra virgin olive oil, prosecutors say the oil was actually a mixture of 70-80 percent sunflower oil and just 20-30 percent olive oil. During a hearing in the Córdoba provincial court in September they sought nine years jail and fines of 8,760 euros (\$11,560) for each of the accused.

According to *El Día de Córdoba*, on Thursday the pair, identified only by their initials – JMAM and JJCJ – and both from Córdoba province, admitted their role in the fraud and accepted a two-year sentence. A third man, FAM, was acquitted.

The three were among more than ten people arrested as part of 'Operation Cholesterol.' A national investigation in Spain in 2006, it followed complaints of suspected olive oil adulteration which were substantiated in testing by regional authorities.

In its initial indictment, the prosecution said the men had used their cooking oil packaging and distribution companies to mix the olive and sunflower oil. Some E141 – a food additive not approved for use in cooking oils – was then added to make the oil's color akin to EVOO.

The oil was later labeled as EVOO in 5-liter metal and plastic containers and sold in Andalusia, Catalonia and in other parts of the Mediterranean coast. It was distributed by two methods: mainly as gifts to people on organized bus tours but also in sales to small establishments and wine cellars. Police also closed an online distribution network for some of the oil.

JMAM was said to be in charge of sales of the fraudulent oil to wholesalers in the food and hospitality sector.

Sources:

El Dia de Córdoba
Olive Oil Times

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This article was last updated December 17, 2011 - 8:57 PM

Olive Oil Origin Investigations Continue

By Julie Butler

Olive Oil Times Contributor | Reporting from Barcelona

China is scrutinizing olive oil arriving from Italy while Spain raises fears of wider market manipulation in the wake of new claims of fraud involving Italian olive oil.

The Shanghai Daily reported that entry-exit authorities are "inspecting olive oil

imported from Italy after the Italian agriculture federation said unscrupulous producers were mixing in cheaper oil from Greece, Spain, Morocco and Tunisia and passing it off as top-end extra virgin oil."



And Spain's *El Pais* quoted Clara Aguilera, agriculture minister in the Andalusian regional government, as saying she fears Italy may be engaging in "stage-management, as there are many vested interests at play." She also pointed to a possible "strategy" to control markets and noted the weakness of Spain's highly-fragmented production sector compared to Italy's strong olive oil lobby, the paper reported.

Meanwhile, Rafael Civantos of the COAG farmers' union in Spain said it's "common knowledge" that Italy passes off Spanish olive oil as its own because "its figures for olive oil production, consumption and imports don't add up."

It's an issue that also raised eyebrows within the European Commission's advisory group on olives and derived products earlier in 2011. The minutes note: "Concerning figures on the Italian



market, a discrepancy between production figures and estimated production figures (was) observed for which participants asked for clarification. Moreover, a difference between the figures presented by the Commission and what is observed in the field was noted and voiced."

And in its breaking news article of the latest probes of Italian olive oil, Italy's *La Repubblica* itself asked, "Why, in comparison with the 250,000 tons of olive oil we export, do we import 470,000? Where do they go? How are they mixed?"

It's a question, the newspaper reported, was being probed by Italian customs agents, fraud squad detectives and finance police, with the help of Coldiretti, one of the country's main agricultural organizations. The investigation had already found that four out of five bottles of olive oil sold by Italy contain olive oil from other countries, usually from Spain, Tunisia, Greece or Morocco.

Coldiretti spokesman Stefano Masini said that given the extraordinary scale of the fraud it was time for the government "to act against the agromafia with new measures." "This is not just about simple sales fraud, it involves criminal organizations that control prices and manage the entire chain from production to distribution," he said.

News of the probe has provoked international debate among consumers and producers, such as at the UK's *Telegraph*, which reported: "Four out of five bottles of 'Italian' olive oil are being adulterated with lower quality oil from other Mediterranean countries."

But Rafael Sánchez de Puerta, president of the EU farming lobby Copa-Cogeca's working group on olive oil and table olives, stressed that the issue was more one of labeling than of quality.

"Everyone knew" that Italy bottled and exported more olive oil than it produced but any alleged fraud involved claims of the "denomination (of origin), not of the quality" of the oil, he said.

Sources:

Shanghai Daily
El País
The Telegraph

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This article was last updated December 31, 2011 - 7:44 AM

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Eddie Zilli Fined \$150,000 for Offences Under the Food and Drugs Act

July 24, 2009, Guelph, ON - On March 3, 2009 a conviction was registered against Eddie Zilli in the Ontario Court of Justice in Toronto for offences under the *Food and Drugs Act*. The Honourable Justice Reinhardt ordered Mr. Zilli to pay \$50,000 per count, on three counts, for a total fine of \$150,000 and ordered 47,436 litres of seized oil forfeited to the Crown to be disposed.

Mr. Zilli unlawfully imported a quantity of oil labelled as extra virgin olive oil, that was in fact blended oil, containing approximately 50 per cent sunflower oil. The offences occurred between January 1, 2006 and April 30, 2006. The imported oil did not meet the prescribed standard for olive oil, set out in *Food and Drugs Regulation* B.09.003[S], which requires among other things, that olive oil "shall be the oil obtained from the fruit of the olive tree." The importations were therefore contrary to Section 6(1)(a) of the *Food and Drugs Act* which states that no person shall import any article intended for sale that is likely to be mistaken for food, unless the article complies with any standard that has been prescribed.

Olive oil is a commodity that can easily be diluted or substituted with cheaper oil. The presence of other oils in olive oil cannot be detected by visual inspection and therefore consumers rely on the labelling. Health conscious consumers purchase extra virgin olive oil for the health benefits they believe are associated with the product.

- 30 -

For more information, media may contact:

Marilyn Taylor (English)
Communications Specialist, Ontario Area, 519-837-5852

JoAnne Ford (French)
Area Communications Manager, Ontario Area, 519-826-3027

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ADVISORY
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